

### 13. Courses of Study and Scheme of Assessment

#### BE ELECTRONICS AND COMMUNICATION ENGINEERING

(2015 REGULATIONS)  
(Minimum credits to be earned: 183)

Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
<b>SEMESTER I</b>									
15L101	Calculus and its Applications	3	2	0	4	50	50	100	BS
15L102	Physics	3	0	0	3	50	50	100	BS
15L103	Chemistry	3	0	0	3	50	50	100	BS
15L104	Problem Solving and C Programming	2	2	0	3	50	50	100	BS
15L105	Principles of Electrical Engineering	4	0	0	4	50	50	100	ES
15M104	English Language Proficiency	2	2	0	3	50	50	100	HS
15L111	Physics Laboratory I	0	0	2	1	100	-	100	BS
15L112	Chemistry Laboratory I	0	0	2	1	100	-	100	BS
15L113	Engineering Practices	0	0	2	1	100	-	100	ES
15L214	Personality and Character Development	0	0		Refer sem 2 and footnote				MC
Total 29 hrs		17	6	6	23	600	300	900	
<b>SEMESTER II</b>									
15L201	Complex Variables and Transforms	3	2	0	4	50	50	100	BS
15L202	Materials Science	3	0	0	3	50	50	100	BS
15L203	Applied Electro Chemistry	3	0	0	3	50	50	100	BS
15L204	Electron Devices	3	0	0	3	50	50	100	ES
15L205	Network Theory	3	0	0	3	50	50	100	ES
15M__	Language Elective	3	0	0	3	50	50	100	HS
15L210	Engineering Graphics	0	0	4	2	100	-	100	ES
15L211	Physics Laboratory II	0	0	2	1	100	-	100	BS
15L212	Chemistry Laboratory II	0	0	2	1	100	-	100	BS
15L213	Circuits and Devices Laboratory	0	0	2	1	100	-	100	ES
15L214	Personality and Character Development	0	0	**	Grade	-	-	-	MC
Total 30 hrs		18	2	10	24	700	300	1000	

CAT-Category; BS – Basic Science; HS – Humanities & Social Sciences; ES – Engineering Sciences; PC – Professional Core; PE – Professional Elective; EEC – Employability Enhancement Course; MC – Mandatory Course.

**BE ELECTRONICS AND COMMUNICATION ENGINEERING****(2015 REGULATIONS)**

Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
<b>SEMESTER II – Summer Term<sup>€</sup></b>									
15L215	Professional Skills	6	0	9	2	100	-	100	EEC
15L216	In-Plant Training & Technical Seminar	6	0	9	2	100	-	100	EEC
Total 30 hrs		12	0	18	4	200		200	

CA - Continuous Assessment

FE - Final Examination

\*\* - Total 40 hrs in semesters I &amp; II put together.

Grade: Completed / Not Completed.

€ - These courses will be conducted prior to the commencement of the third semester for a period of 4 weeks during summer term.

**CAT-Category; BS – Basic Science; HS – Humanities & Social Sciences; ES – Engineering Sciences; PC – Professional Core; PE – Professional Elective; EEC – Employability Enhancement Course; MC – Mandatory Course.**

**BE ELECTRONICS AND COMMUNICATION ENGINEERING**
**(2015 REGULATIONS)**

Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
<b>SEMESTER III</b>									
15L301	Linear Algebra and Numerical Analysis	3	2	0	4	50	50	100	BS
15L302	Analog Electronics	4	0	0	4	50	50	100	ES
15L303	Digital Electronics	4	0	0	4	50	50	100	ES
15L304	Electromagnetic Fields	3	2	0	4	50	50	100	ES
15L305	Measurements and Instrumentation	2	2	0	3	50	50	100	ES
15M070	Economics for Engineers	3	0	0	3	50	50	100	HS
15L311	Analog Electronics Laboratory	0	0	2	1	100	-	100	ES
15L312	Digital Electronics Laboratory	0	0	2	1	100	-	100	ES
Total 29 hrs		19	6	4	24	500	300	800	

**SEMESTER IV**

15L401	Probability and Random Processes	3	2	0	4	50	50	100	BS
15L402	Linear Integrated Circuits	3	0	0	3	50	50	100	PC
15L403	Signals and Systems	4	0	0	4	50	50	100	PC
15L404	Transmission Lines and Waveguides	3	2	0	4	50	50	100	PC
15L405	Computer Architecture	3	2	0	4	50	50	100	PC
15____	Open Elective I*	3	0	0	3	50	50	100	OE
15L411	Linear Integrated Circuits Laboratory	0	0	2	1	100	-	100	PC
15L412	Signals and Systems Laboratory	0	0	2	1	100	-	100	PC
Total 29 hrs		19	6	4	24	500	300	800	

CA - Continuous Assessment

FE - Final Examination

**CAT-Category; BS – Basic Science; HS – Humanities & Social Sciences; ES – Engineering Sciences; PC – Professional Core; PE – Professional Elective; EEC – Employability Enhancement Course**

\* – LTPC for open electives can be either 3 0 0 3 or 2 2 0 3.

**BE ELECTRONICS AND COMMUNICATION ENGINEERING****(2015 REGULATIONS)**

Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
<b>SEMESTER V</b>									
15L501	Antennas and Wave Propagation	3	2	0	4	50	50	100	PC
15L502	Analog Communication	3	0	0	3	50	50	100	PC
15L503	Microprocessors and Microcontrollers	3	0	0	3	50	50	100	PC
15L504	Control Systems	3	2	0	4	50	50	100	PC
15L___	Professional Elective I	3	0	0	3	50	50	100	PE
15___	Open Elective II*	3	0	0	3	50	50	100	OE
15L511	Analog Communication Laboratory	0	0	2	1	100	-	100	PC
15L512	Microprocessors and Microcontrollers Laboratory	0	0	2	1	100	-	100	PC
15L513	Innovation Practices	0	0	4	2	100	-	100	EEC
Total 30 hrs		18	4	8	24	600	300	900	

**SEMESTER VI**

15L601	Digital Signal Processing	4	0	0	4	50	50	100	PC
15L602	Statistical Theory of Communication	2	2	0	3	50	50	100	PC
15L603	VLSI Design	3	0	0	3	50	50	100	PC
15L604	Computer Networks	3	2	0	4	50	50	100	PC
15L___	Professional Elective II	3	0	0	3	50	50	100	PE
15L___	Open Elective III*	3	0	0	3	50	50	100	OE
15L611	Digital Signal Processing Laboratory	0	0	2	1	100	-	100	PC
15L612	VLSI Design Laboratory	0	0	2	1	100	-	100	PC
15L613	Embedded Computing Laboratory	0	0	4	2	100	-	100	EEC
Total 30 hrs		18	4	8	24	600	300	900	

CA - Continuous Assessment

FE - Final Examination

CAT-Category; BS – Basic Science; HS – Humanities &amp; Social Sciences; ES – Engineering Sciences; PC – Professional

Core; PE – Professional Elective; EEC – Employability Enhancement Course

\* – LTPC for open electives can be either 3 0 0 3 or 2 2 0 3.

**BE ELECTRONICS AND COMMUNICATION ENGINEERING****(2015 REGULATIONS)**

Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
<b>SEMESTER VII</b>									
15L701	Microwave Engineering	3	0	0	3	50	50	100	PC
15L702	Digital Communication	3	0	0	3	50	50	100	PC
15L703	Wireless Communication	3	0	0	3	50	50	100	PC
15L704	Environmental Science and Engineering	3	0	0	3	50	50	100	ES
15L___	Professional Elective III	3	0	0	3	50	50	100	PE
15L___	Professional Elective IV	3	0	0	3	50	50	100	PE
15L711	Microwave Engineering Laboratory	0	0	2	1	100	-	100	PC
15L712	Digital Communication Laboratory	0	0	2	1	100	-	100	PC
15L720	Project Work I	0	0	4	2	100	-	100	EEC
Total 26 hrs		18	0	8	22	600	300	900	

**SEMESTER VIII**

15L___	Professional Elective V	3	0	0	3	50	50	100	PE
15L___	Professional Elective VI	3	0	0	3	50	50	100	PE
15L820	Project Work II	0	0	16	8	50	50	100	EEC
Total 22 hrs		6	0	16	14	150	150	300	

CA - Continuous Assessment  
 FE - Final Examination

**CAT-Category; BS – Basic Science; HS– Humanities & Social Sciences; ES – Engineering Sciences; PC – Professional Core; PE – Professional Elective; EEC – Employability Enhancement Course**

## LANGUAGE ELECTIVES

15M080	Communication Skills for Engineers
15M081	Basic German
15M082	Basic French
15M083	Basic Japanese

## OPEN ELECTIVES

(Students can opt for all open electives from single stream or several streams)

### MATHEMATICS

15OH01	Advanced Linear Algebra
15OH02	Algebraic Structures
15OH03	Calculus of Variations and Tensor Analysis
15OH04	Graph Theory and its Applications
15OH05	Mathematical Finance
15OH06	Mathematical Modeling and Simulation
15OH07	Number Theory for Computing
15OH08	Operations Research
15OH09	Reliability and Quality Control
15OH10	Soft Computing
15OH11	Stochastic Models

### PHYSICS

15OH20	Analytical Techniques for Materials Characterization
15OH21	Laser Technology
15OH22	Micro Electromechanical Systems
15OH23	Nanomaterials and Applications
15OH24	Physics for Solar PV Systems and Solid-State Lighting Systems
15OH25	Sensors for Engineering Applications
15OH26	Thin Film Technology
15OH27	Nonlinear Science and Engineering Applications
15OH28	Nonlinear Fiber Optics
15OH29	Chaotronics

### CHEMISTRY

15OH33	Chemical Sensors and Biosensors
15OH37	Energy Storing Devices and Fuel Cells
15OH39	Modern Electronic Materials

### COMPUTER APPLICATIONS

15OH46	Computer Graphics and Virtual Reality
15OH47	Data and File Structures
15OH48	Database Management System
15OH49	High Performance Computing
15OH50	Mainframe Systems
15OH51	Mobile Application Development
15OH52	Multicore Programming
15OH53	Object Oriented Programming
15OH54	Programming in Python
15OH55	Responsive Web Design
15OH56	Social Web Mining
15OH57	Software Engineering
15OH58	Java Programming
15OH59	Geographic Information System
15OH60	Programming for Robotics

### HUMANITIES

15OH61	An Introduction to Indian Constitution
15OH62	Entrepreneurship
15OH63	Human Resource Management
15OH64	Industrial Psychology

15OH65	Principles of Management
15OH66	Business Statistics
15OH67	Disaster Management
15OH68	Financial and Managerial Accounting
15OH69	Marketing Management
15OH70	Defence Practices and Disaster Management

### **ENGLISH**

15OH75	English and Soft Skills for Employability
15OH76	English for Competitive Examinations
15OH77	German Language – International Level A1.1
15OH78	German Language – International Level A1.2

### **APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES**

15OH81	Data Structures and Algorithms
15OH82	Optimization Techniques
15OH83	Data Science
15OH84	Data Visualization
15OH85	Artificial Intelligence
15OH86	Pervasive Computing
15OH87	Parallel and Distributed Computing
15OH88	Cyber Security
15OH89	Randomized Algorithms
15OH90	Approximation Algorithms
15OH91	Network Science
15OH92	Applied Stochastic Processes
15OH93	Modelling and Simulation
15OH94	Graph Algorithms

## **PROFESSIONAL ELECTIVES OFFERED BY THE DEPARTMENT**

### **ADVANCED COMMUNICATIONS SYSTEMS**

15L001	Satellite Communication
15L002	Digital Switching Systems
15L003	Fiber Optic Communication
15L004	Radar Communication

### **RADIO FREQUENCY SYSTEMS**

15L005	Radio Frequency Integrated Circuits
15L006	Computational Electromagnetics
15L007	Advanced Radiating System
15L008	Smart Antennas

### **SIGNAL PROCESSING**

15L009	Digital Image Processing
15L010	Speech Signal Processing
15L011	Multimedia Compression Techniques
15L012	Wavelets and its Applications
15L013	Advanced Digital Signal Processing
15L014	Pattern Recognition

### **NETWORKS**

15L015	Wireless Systems and Standards
15L016	Wireless Sensor Networks
15L017	Wireless Networking
15L018	Long Term Evolution Technologies
15L019	Network Security

### **VLSI DESIGN TECHNIQUES**

15L020	FPGA Based System Design
--------	--------------------------

15L021	Analog VLSI Circuits
15L022	Low Power VLSI Design
15L023	Nano Electronics
15L024	Device Modeling
15L025	System-on-Chip Design

#### **SYSTEM DESIGN**

15L026	Embedded System Design
15L027	Digital Signal Processing System Design
15L028	Vehicular Systems and Networks
15L029	Advanced Processor Architectures
15L030	Real time systems

#### **COMPUTER SCIENCE ELECTIVES**

15L031	Advanced Computer Architecture and Parallel Processing
15L032	Data Structures
15L033	Embedded Linux
15L034	Operating Systems
15L035	Relational Database Management Systems
15L036	Soft Computing Techniques
15L037	Computer and Machine Vision

#### **ONE CREDIT COURSES**

##### **OFFERED BY THE DEPARTMENT**

15LF01	Linux and Scripting Languages
15LF02	RTOS and its Applications
15LF03	LTE and the Evolution to 4G Wireless Communications
15LF04	Avionics
15LF05	System Level Verification Techniques and Methodologies
15LF06	Automotive Electronic Applications
15LF07	Machine Vision Algorithms and System Design
15LF08	Millimeter Wave Communication Networks
15LF09	Wireless System Design
15LF10	Telematics
15LF11	Advanced Avionics
15LF12	E-Commerce Security
15LF13	Simulation Technologies for real time communication networks
15LF14	Internet of Things(IoT)
15LF15	Systems and Transforms
15LF16	Nano Technology
15LF17	Routing Architecture and Design
15LF18	Automotive Controller Area Networks and Security
15LF19	Optical Fiber Link Management
15LF20	Fiber Optic Cable Installation and OTDR Testing

##### **OFFERED BY HUMANITIES DEPARTMENT**

15OF01	Export – Import Management
15OF02	Insurance & Risk Management
15OF03	Values and Ethics at Work Place
15OF04	Development of Industrialisation
15OF05	Creativity and Social Enterprise
15OF06	Social and Psychological Well Being
15OF13	Security Analysis and Portfolio Management
15OF14	Implementation of Quality Management System
15OF15	Financial Management
15OF16	Personality Development through Transactional Analysis



**OFFERED BY THE DEPARTMENT OF ENGLISH**

15OF10 Corporate Communication  
 15OF11 Interpersonal and Organizational Communication  
 15OF12 Human Values Through Literature

**OFFERED BY THE DEPARTMENT OF MATHEMATICS**

15OF21 Principles of Business Analytics

**SUMMARY OF CREDIT DISTRIBUTION**

<b>B.E. ELECTRONICS AND COMMUNICATION ENGINEERING</b>												
<b>S. No</b>	<b>Course Work subject Area</b>	<b>Credits Per Semester</b>								<b>Total Credit</b>	<b>Credit Range</b>	
		<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>		<b>Min</b>	<b>Max</b>
1	<b>HS</b>	3	3	3	0	0	0	0	0	9	9	18
2	<b>BS</b>	15	12	4	4	0	0	0	0	35	27	36
3	<b>ES</b>	5	9	17	0	0	0	3	0	34	27	36
4	<b>PC</b>	0	0	0	17	16	16	11	0	60	54	72
5	<b>PE</b>	0	0	0	0	3	3	6	6	18	18	27
6	<b>OE</b>	0	0	0	3	3	3	0	0	9	9	18
7	<b>EEC</b>	0	<b>0 + 4*</b>	0	0	2	2	2	8	18	18	27
	<b>Total</b>	23	<b>24+4*</b>	24	24	24	24	22	14	<b>183</b>	<b>175</b>	<b>185</b>

\*-Summer Term

CAT-Category; BS – Basic Science; HS – Humanities & Social Sciences; ES – Engineering Sciences; PC – Professional Core; PE – Professional Elective; EEC – Employability Enhancement Course