

13. Courses of Study and Scheme of Assessment

BE ELECTRICAL AND ELECTRONICS ENGINEERING (SANDWICH) (2015 REGULATIONS)

Minimum credits to be earned : 182

Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER I									
15E101	Calculus and its Applications	3	2	0	4	50	50	100	BS
15E102	Physics	3	0	0	3	50	50	100	BS
15E103	Chemistry	3	0	0	3	50	50	100	BS
15E104	Problem Solving & C Programming	2	2	0	3	50	50	100	ES
15M104	English Language Proficiency	2	2	0	3	50	50	100	HS
15E111	Physics Laboratory I	0	0	2	1	100	-	100	BS
15E112	Chemistry Laboratory I	0	0	2	1	100	-	100	BS
15E100	Industrial Training I	0	0	10	5%	100	-	100	EEC
15E214	Personality and Character Development	0	0	Refer sem 2 and footnote					MC
Total 23 hrs		13	6	4+10	18+5%	450	250	700	

SEMESTER II									
15E201	Complex Variables and Transforms	3	2	0	4	50	50	100	BS
15E105	Electric Circuits	2	2	0	3	50	50	100	PC
15E202	Material Science	3	0	0	3	50	50	100	BS
15E203	Applied Electrochemistry	3	0	0	3	50	50	100	BS
15M___	Language Elective	3	0	0	3	50	50	100	HS
15E110	Electrical Engineering Drawing	2	2	0	3	100	-	100	ES
15E211	Physics Laboratory II	0	0	2	1	100	-	100	BS
15E212	Chemistry Laboratory II	0	0	2	1	100	-	100	BS
15E200	Industrial Training II	0	0	10	5%	100	-	100	EEC
15E214	Personality and Character Development	0	0	-		Grade			MC
Total 26 hrs		16	6	4+10	21+5%	550	250	800	

CA - Continuous Assessment

FE - Final Examination

% - Will be counted for TGPA (Training Grade Point Average) computation

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

Grade: Completed / Not Completed.

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Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER II – Summer Term €									
15E215	Professional Skills	6	0	9	2	100	-	100	EEC
15E217	Internship – I	6	0	9	2	100	-	100	EEC
Total 30 hrs		12	0	18	4	200	-	200	
SEMESTER III									
15E301	Linear Algebra and Numerical Analysis	3	2	0	4	50	50	100	BS
15E204	Network Theory	2	2	0	3	50	50	100	PC
15E303	Electromagnetic Theory	2	2	0	3	50	50	100	ES
15E205	Basic Mechanical Engineering & Practices	3	2	0	4	50	50	100	ES
15M070	Economics for Engineers	3	0	0	3	50	50	100	HS
15E210	Circuits & Networks Laboratory	0	0	2	1	100	-	100	PC
15E300	Industrial Training III	0	0	10	5%	100	-	100	EEC
Total 23 hrs		13	8	2+10	18+5%	350	250	600	
SEMESTER IV									
15E401	Probability & Random Processes	3	2	0	4	50	50	100	BS
15E302	Electronic Devices	3	0	0	3	50	50	100	ES
15E304	DC Machines & Transformers	2	2	0	3	50	50	100	PC
15E305	Digital Electronics	4	0	0	4	50	50	100	PC
15_____	Open Elective I*	3	0	0	3	50	50	100	OE
15E310	DC Machines & Transformers Laboratory	0	0	4	2	100	-	100	PC
15E311	Electronic Devices and Digital Electronics Laboratory	0	0	4	2	100	-	100	PC
15E400	Industrial Training IV	0	0	10	5%	100	-	100	EEC
Total 27 hrs		15	4	8+10	21+5%	450	250	700	

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

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* - LTPE for open electives can be either 3 0 0 3 or 2 2 0 3.

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Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER V									
15E402	Electronic Circuits	3	0	0	3	50	50	100	PC
15E403	Induction and Synchronous Machines	2	2	0	3	50	50	100	PC
15E404	Computer Architecture	4	0	0	4	50	50	100	PC
15E405	Control Systems	2	2	0	3	50	50	100	ES
15E505	Measurements and Instrumentation	3	0	0	3	50	50	100	ES
15E410	Induction and Synchronous Machines Laboratory	0	0	4	2	100	-	100	PC
15E411	Electronic Circuits & Control System Laboratory	0	0	4	2	100	-	100	PC
15E500	Industrial Training V	0	0	10	5%	100	-	100	EEC
Total 26 hrs		14	4	8+10	20+5%	500	300	800	
SEMESTER VI									
15E502	Microprocessors and Microcontrollers	2	2	0	3	50	50	100	PC
15E503	Linear ICs and Applications	4	0	0	4	50	50	100	PC
15E504	Power Electronics and Applications	4	0	0	4	50	50	100	PC
15E603	Generation, Transmission and Distribution	4	0	0	4	50	50	100	PC
15____	Open Elective II*	3	0	0	3	50	50	100	OE
15E510	Power Electronics & Linear ICs Laboratory	0	0	4	2	100	-	100	PC
15E511	Microprocessors and Microcontrollers Laboratory	0	0	2	1	100	-	100	PC
15E512	Measurements and Instrumentation Laboratory	0	0	2	1	100	-	100	PC
15E600	Industrial Training VI	0	0	10	5%	100	-	100	EEC
Total 27 hrs		17	2	8+10	22+5%	450	250	700	

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Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER VII									
15E501	Electrical Machine Design	2	2	0	3	50	50	100	PC
15E601	Electric Drives and Control	3	0	0	3	50	50	100	PC
15E703	Environmental Science and Engineering	3	0	0	3	50	50	100	ES
15___	Open Elective III*	3	0	0	3	50	50	100	OE
15E610	Power Converter Design and Drives Laboratory	0	0	2	1	100	-	100	PC
15E612	Internship – II & Innovation Practices	0	0	4	2	100	-	100	EEC
15E700	Industrial Training VII***	0	0	10	5%	100	-	100	EEC
Total 19 hrs		11	2	6+10	14+5%	600	200	800	

SEMESTER VIII

15E602	Digital Signal Processing	2	2	0	3	50	50	100	PC
15E604	Data Structures and Algorithms	2	2	0	3	50	50	100	ES
15E702	Power System Analysis	2	2	0	3	50	50	100	PC
15E__	Professional Elective I	3	0	0	3	50	50	100	PE
15E__	Professional Elective II	3	0	0	3	50	50	100	PE
15E611	Digital Signal Processing & Data Structures Laboratory	0	0	2	1	100	-	100	PC
15E800	Industrial Training VIII	0	0	10	5%	100	-	100	EEC
Total 18 hrs		12	6	2+10	16+5%	450	250	700	

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 *** - Students will undergo the course work and / or training in an industry immediately after the 6th semester examinations for a period of 3 months and study the remaining courses of the VII semester after completing these components.

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Code No.	Course	Hours / week				Maximum marks			
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER IX									
15E701	Power Systems Protection & Switch Gear	4	0	0	4	50	50	100	PC
15E___	Professional Elective III	3	0	0	3	50	50	100	PE
15E___	Professional Elective IV	3	0	0	3	50	50	100	PE
15E___	Professional Elective V	3	0	0	3	50	50	100	PE
15E710	Power Systems Laboratory	0	0	2	1	100	-	100	PC
15E720	Project Work I	0	0	4	2	100	-	100	EEC
15E900	Industrial Training IX	0	0	10	5%	100	-	100	EEC
Total 17 hrs		13	0	6+10	16+5%	300	200	500	
SEMESTER X									
15E___	Professional Elective VI	3	0	0	3	50	50	100	PE
15E820	Internship – III & Project Work II	0	0	16	8	50	50	100	EEC
Total 19 hrs		3	0	16	11	100	100	200	

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LANGUAGE ELECTIVES

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

OPEN ELECTIVES

(Students can opt for open electives from the list given below and from NPTEL/SWAYAM PORTAL as per academic regulation of the college)

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
15OH12	Modelling Flow Through Microchannels

PHYSICS

15OH18	Quantum Mechanics
15OH19	MEMS Sensors and Actuators for Industrial Applications
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
15OH79	English for Competitive Examinations (Basic Level)

APPAREL AND FASHION DESIGN

15FOD1	Theatre and Film Costumes
15FOD2	Elements and Principles of Fashion Design
15FOD3	World Art and Craft
15FOD4	Fashion Journalism

APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES

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

APPLIED SCIENCES

15OH97	Nano Magnetism and Spintronics
15OH98	Financial Engineering

PROFESSIONAL ELECTIVES

GROUP A: ELECTRICAL / POWER

15E001	Flexible AC Transmission Systems
15E002	Special Machines and Controllers
15E003	Renewable Energy Sources
15E004	Utilization of Electrical Energy
15E005	Advanced Control Systems
15E006	Smart Grid
15E007	PLC and SCADA
15E008	HVDC Transmission
15E009	Power Quality

GROUP B: ELECTRONICS / EMBEDDED

15E011	Embedded System Design
15E012	Advanced Microprocessors and Microcontrollers
15E013	Digital System Design
15E014	VLSI Design
15E015	Mixed Signal VLSI Design
15E016	Virtual Instrumentation
15E017	Communication Systems
15E018	Neural Networks & Fuzzy Systems
15E019	Automotive Electrical and Electronics Systems

GROUP C : COMPUTER

15E021	Advanced Data Structures
15E022	Computer Networks
15E023	Software Project Management and Quality Assurance
15E024	Advanced Computer Architecture

15E025	Personal Computer Systems
15E026	Internetworking and Applications
15E027	Java Programming and Applications
15E028	Relational Database Management Systems
15E029	Operating Systems
15E030	Total Quality Management
15E031	Data Communication and Networking

OPEN ELECTIVES OFFERED BY ENGINEERING DEPARTMENTS
(Students can register for open electives when offered by engineering departments
excluding those offered by their parent department)

AUTOMOBILE ENGINEERING

15AH01	Automotive Infotronics
15AH02	Off Highway Vehicles
15AH03	Electric and Hybrid Vehicles
15AH04	Electric, Hybrid and Fuel Cell Vehicles
15AH06	Motor Vehicle Engineering

COMPUTER SCIENCE AND ENGINEERING

15ZH01	Multimedia Systems and Applications
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ELECTRICAL AND ELECTRONICS ENGINEERING

15EH01	Sustainable Energy Systems
15EH03	Renewable Energy Sources

MECHANICAL ENGINEERING

15MH01	Project Engineering
15MH02	Total Quality Management
15MH03	Industrial engineering and management
15MH04	Enterprise Resource Planning
15MH05	Six Sigma Project Methodology

PRODUCTION ENGINEERING

15PH04	Financial Management and Accounting
15PH07	Virtual Reality Systems and Applications
15PH08	Foundation Skills in Integrated Product Development

ROBOTICS AND AUTOMATION ENGINEERING

15RH02	Introduction to Robotics & Automation
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BIOTECHNOLOGY

15BH03	Water Resource Management
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INFORMATION TECHNOLOGY

15IH03	Graphics and Multimedia
15IH06	Information Storage and Management

TEXTILE TECHNOLOGY (FT & PT)

15TH01	Characterization of Fibers and Polymers
15TH02	Sound and Thermal Isolation Products and Characterization
15TH03	Technical Textiles in Engineering Applications
15TH04	Electro Active Textiles
15TH05	Filtration Products and Characterization
15TH06	Industrial Textiles
15TH10	Textiles and Fabric Care

ONE CREDIT COURSES

OFFERED BY THE DEPARTMENT

15EF01	LV Switchgears
15EF02	Energy Auditing and Conservation Techniques
15EF03	Electrical Safety Standards and Practices
15EF04	Automotive Electrical Systems
15EF05	CAD Tools for VLSI Design Automation
15EF06	Digital Design with Verilog HDL

15EF07	Graphical Programming
15EF08	Advanced Graphical Programming
15EF09	Low Power Microcontrollers and Applications
15EF10	Controller Design And Simulation using dSPACE
15EF11	Solar PV Systems: Design, Simulation, and Monitoring and Control
15EF12	Power Electronics in More-Electric Aircraft
15EF13	Field Programmable Analog Array for Analog System Design
15EF14	Systems Engineering for Automotive Applications
15EF15	Electric Vehicles
15EF16	Phasor Measurement Units and Applications
15EF17	Graphical Programming for Real-Time Applications
15EF18	Industrial Drives for Automation
15EF19	Data Science and Analytics for Electrical Engineers
15EF20	Electrical Power On Board War Vessels and Aircraft
15EF21	Internet of Things using CC3200

OFFERED BY HUMANITIES

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
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OFFERED BY THE DEPARTMENT OF PHYSICS

15OF31	X-Ray Lithography Processes
15OF32	Synchrotron Radiation Based Characterization of Nanomaterials

SUMMARY OF CREDIT DISTRIBUTION

Electrical and Electronics Engineering (Sandwich)												
S. No.	Course Work subject Area	Credits Per Semester										Total Credit
		I	II	III	IV	V	VI	VII	VIII	IX	X	
1	HS	3	3	3	0	0	0	0	0	0	0	9
2	BS	12	12	4	4	0	0	0	0	0	0	32
3	ES	3	3	7	3	6	0	3	3	0	0	28
4	PC	0	3	4	11	14	19	7	7	5	0	70
5	PE	0	0	0	0	0	0	0	6	9	3	18
6	OE	0	0	0	3	0	3	3	0	0	0	9
7	EEC	0	4*	0	0	0	0	2	0	2	8	16

8	TOTAL	18	25	18	21	20	22	15	16	16	11	182
9	Credit Min.	18	25	18	18	20	18	12	14	13	8	
10	Credit Max.	18	25	18	21	20	24	18	20	19	11	

* Summer Term