AMRITA VISHWA VIDYAPEETHAM
School of Engineering

AMRITAPURI, BENGALURU, COIMBATORE, CHENNAI

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech. in ELECTRICAL AND COMPUTER ENGINEERING
(BTC-ELC)

CURRICULUM 2019

SEMESTER I

Cat.	Code	Title	L T P	Credit
HUM	19ENG111	Technical Communication	2 0 3	3
SCI	19MAT101	Single Variable Calculus	1 0 0	1
SCI	19MAT106	Ordinary Differential Equation	2 0 0	2
SCI	19MAT102	Matrix Algebra	2 0 0	2
ENGG	19CSE100	Problem Solving and Algorithmic Thinking	2 1 3	4
SCI	19PHY101/ 19CHY102	Engineering Physics - A/ Engineering Chemistry - B	2 1 0	3
SCI	19PHY181/ 19CHY182	Engineering Physics Lab - A / Engineering Chemistry Lab - B	0 0 3	1
ENGG	19MEE181	Manufacturing Practice	0 0 3	1
ENGG	19MEE100	Engineering Graphics - CAD	2 0 3	3
HUM	19CUL101	Cultural Education - I	2 0 0	2
		Total	32	22

SEMESTER II

Cat.	Code	Title	L T P	Credit
HUM		Free Elective I**	2 0 0	2
SCI	19MAT111	Multivariable Calculus	2 0 0	2
SCI	19MAT116	Laplace Transform	1 0 0	1
SCI	19PHY101/ 19CHY102	Engineering Physics - A/ Engineering Chemistry - B	2 1 0	3
SCI	19PHY181/ 19CHY182	Engineering Physics Lab - A / Engineering Chemistry Lab - B	0 0 3	1
ENGG	19CSE102	Computer Programming	3 0 3	4
ENGG	19EEE113	Electrical Engineering practice	1 0 3	2
ENGG	19ELC101	Electrical & Electronic Circuits	3 0 3	4
ENGG	19ELC102	Digital Electronics	3 0 3	4
HUM	19CUL111	Cultural Education - II	2 0 0	2
		Total	35	25

SEMESTER III

Cat.	Code	Title	L T P	Credit
ENGG	19ELC204	Electric Machines	3 0 3	4
ENGG	19ELC205	Microelectronic Circuits	3 0 3	4
ENGG	19ELC201	Sensors and Sensor Circuit Design	3 0 3	4
ENGG	19ELC203	Computer Architecture	2 0 3	3
SCI	19MAT214	Fourier Transforms and Complex Analysis	2 1 0	3
ENGG	19ELC206	Operating Systems	3 0 0	3
ENGG	19ELC202	Object Oriented Programming	1 0 3	2
HUM	19AVP201	Amrita Values Programme I	1 0 0	1
		TOTAL	34	24

SEMESTER IV

Cat.	Code	Title	L T P	Credit
ENGG	19EEE214	Signals & Systems	3 0 3	4
ENGG	19ELC212	Microcontrollers and Applications	3 0 3	4
ENGG	19EEE211	Control Systems	3 0 3	4
ENGG	19ELC211	Data Structures and Algorithms	3 0 3	4
SCI	19MAT216	Probability and Statistics	2 1 0	3
HUM		Free Elective II**	2 0 0	2
HUM	19SSK211	Soft Skills 1	1 0 2	2
HUM	19AVP211	Amrita Value Programme II	1 0 0	1
		TOTAL	33	24

SEMESTER V

Cat.	Code	Title	L T P	Credit
ENGG	19ELC304	Machine Learning	3 0 0	3
ENGG	19ELC301	Real Time Embedded Systems	3 0 3	4
ENGG	19ELC303	Energy Systems	3 0 3	4
ENGG	19ELC302	Embedded Digital Signal Processing	3 0 3	4
ENGG		Professional Elective I*	3 0 0	3
ENGG		Professional Elective II*	3 0 0	3
HUM	19SSK301	Soft Skills II	1 0 2	2
ENGG	19LIV390	[Live In Lab]***		[3]
		TOTAL	30	23+[3]

SEMESTER VI

Cat.	Code	Title	L T P	Credit
ENGG	19ELC313	Power Electronics and Drives	3 0 3	4
ENGG	19ELC312	Data Base Systems and Programming	3 0 3	4
ENGG	19ELC311	Computer Networks and Industrial Communication	3 0 3	4
ENGG		Professional Elective III*	3 0 0	3
ENGG		Professional Elective IV*	3 0 0	3
ENGG	19ELC381	Open Lab	0 0 3	1
HUM	19SSK311	Soft Skills III	1 0 2	2
ENGG	19LIV490	[Live in Lab]***		[3]
	19LAW300	Indian Constitution		P/F
		TOTAL	30	21+ [3]

SEMESTER VII

Cat.	Code	Title	L T P	Credit
ENGG	19ELC401	Theory of Computation and Compiler design	3 1 0	4
ENGG	19ENV300	Environmental Science		P/F
ENGG	19MNG300	Disaster Management		P/F
ENGG		Professional Elective V*	3 0 0	3
ENGG		Professional Elective VI*	3 0 0	3
ENGG		Professional Elective VII*	3 0 0	3
PRJ	19ELC495	Project Phase I	0 0 6	2
		TOTAL	19	15

SEMESTER VIII

Cat.	Code	Title	L T P	Credit
PRJ	19ELC499	Project Phase II	0 0 30	10
		TOTAL	30	10

Total Credits		164

*Professional Elective - Electives categorised under Engineering, Science ,Mathematics, Live-in-Labs, and NPTEL Courses . Student can opt for such electives across departments/campuses.Students with CGPA of 7.0 and above can opt for a maximum of 2 NPTEL courses with the credits not exceeding 8.

** Free Electives - This will include courses offered by Faculty of Humanities and Social Sciences/ Faculty Arts, Commerce and Media / Faculty of Management/Amrita Darshanam -(International Centre for Spiritual Studies).

*** Live-in-Labs - Students undertaking and registering for a Live-in-Labs project, can be exempted from registering for an Elective course in the higher semester.

PROFESSIONAL ELECTIVES

Power & Energy systems				
Cat.	Code	Title	L T P	Credit
ENGG	19EEE331	Smart Grid and IoT	3 0 0	3
ENGG	19EEE335	Power Quality & FACTS	3 0 0	3
ENGG	19EEE337	Power System Management	3 0 0	3
ENGG	19EEE339	Power System Operation Control and Stability	3 0 0	3
ENGG	19EEE336	Power Converters	3 0 0	3
ENGG	19EEE338	Power Plant Instrumentation	3 0 0	3
ENGG	19EEE332	De-regulated power system	3 0 0	3
ENGG	19EEE341	Renewable energy and energy conservation	3 0 0	3
ENGG	19EEE344	Energy storage Systems	3 0 0	3
Cyber Physical Systems and Security				
Cat.	Code	Title	L T P	Credit
ENGG	19CSE331	Cryptography	3 0 0	3
ENGG	19CSE332	Information Security	3 0 0	3
ENGG	19CSE366	Cyber Security	3 0 0	3
ENGG	19CSE469	Information Retrieval	3 0 0	3
ENGG	19CSE470	Digital Forensics	3 0 0	3
Electro-Biological Systems				
Cat.	Code	Title	L T P	Credit
ENGG	19EEE430	Bio medical systems	3 0 0	3
ENGG	19EEE439	Bio Informatics	3 0 0	3
ENGG	19EEE451	Biological Control Systems	3 0 0	3
ENGG	19ECE331	Bio medical instrumentation	3 0 0	3
Automotive Systems				
Cat.	Code	Title	L T P	Credit
ENGG	19EEE432	Vehicular Networks and Communication	3 0 0	3
ENGG	19EEE433	E-mobility Business and Policies	3 0 0	3
ENGG	19EEE434	Automotive Electronics	3 0 0	3
ENGG	19EEE435	Automotive Control Systems	3 0 0	3
ENGG	19EEE436	Vehicle Dynamics and Control	3 0 0	3
ENGG	19EEE437	Electric Vehicle Technology	3 0 0	3
Embedded Systems, Robotics & Artificial Intelligence				
Cat.	Code	Title	L T P	Credit
ENGG	19CSE350	Internet of Things	3 0 0	3
ENGG	19CSE363	Artificial Intelligence	3 0 0	3

Cat.	Code	Title	L T P	Credit
ENGG	19CSE367	**Digital Image Processing**	**3 0 0**	**3**
ENGG	19EEE352	**Digital Control Systems**	**3 0 0**	**3**
ENGG	19EEE353	**Process Control and Instrumentation**	**3 0 0**	**3**
ENGG	19EEE354	**Introduction to Robotics**	**3 0 0**	**3**
ENGG	19EEE355	**Mechatronics**	**3 0 0**	**3**
ENGG	19EEE358	**Advanced Microcontrollers**	**2 0 3**	**3**
ENGG	19EEE362	**Deep Learning for Visual Computing**	**3 0 0**	**3**
ENGG	19EEE363	**Digital system design with FPGA**	**3 0 0**	**3**
		Advanced Computer Technologies		
Cat.	**Code**	**Title**	**L T P**	**Credit**
ENGG	19CSE349	**Virtual Reality**	**3 0 0**	**3**
ENGG	19CSE364	**Big Data Analytics**	**3 0 0**	**3**
ENGG	19CSE447	**Cloud computing**	**3 0 0**	**3**
ENGG	19CSE448	**Block Chain**	**3 0 0**	**3**
ENGG	19CSE449	**Mobile applications and development**	**3 0 0**	**3**
ENGG	19CSE450	**Quantum Computing**	**3 0 0**	**3**
ENGG	19CSE468	**Web Technology and Applications**	**3 0 0**	**3**

GENERAL ELECTIVES				
Cat.	**Code**	**Title**	**L T P**	**Credit**
ENGG	19EEE201	**Electromagnetic Theory**	**3 0 0**	**3**
ENGG	19EEE440	**Wireless Sensor Networks**	**3 0 0**	**3**
ENGG	19EEE442	**Opto-electronics & Laser Instrumentation**	**3 0 0**	**3**
ENGG	19EEE444	**Electromagnetic Compatability**	**3 0 0**	**3**
ENGG	19EEE445	**Illumination Engineering**	**3 0 0**	**3**
ENGG	19EEE449	**3D Printing and Design**	**3 0 0**	**3**
ENGG	19EEE452	**Formal Methods**	**3 0 0**	**3**
ENGG	19EEE453	**RF Circuit Design**	**3 0 0**	**3**
ENGG	19EEE454	**Software-Engineering**	**3 0 0**	**3**
ENGG	19MNG331	**Financial Management**	**3 0 0**	**3**
ENGG	19MAT213	**Optimization Techniques**	**3 0 0**	**3**

PROFESSIONAL ELECTIVES UNDER SCIENCE STREAM

		CHEMISTRY		
Cat.	Code	Title	L T P	Credit
SCI	19CHY243	Computational Chemistry and Molecular Modelling	3 0 0	3
SCI	19CHY236	Electrochemical Energy Systems and Processes	3 0 0	3
SCI	19CHY240	Fuels and Combustion	3 0 0	3
SCI	19CHY232	Green Chemistry and Technology	3 0 0	3
SCI	19CHY239	Instrumental Methods of Analysis	3 0 0	3
SCI	19CHY241	Batteries and Fuel Cells	3 0 0	3
SCI	19CHY242	Corrosion Science	3 0 0	3
		PHYSICS		
SCI	19PHY340	Advanced Classical Dynamics	3 0 0	3
SCI	19PHY342	Electrical Engineering Materials	3 0 0	3
SCI	19PHY331	Physics of Lasers and Applications	3 0 0	3
SCI	19PHY341	Concepts of Nanophysics and Nanotechnology	3 0 0	3
SCI	19PHY343	Physics of Semiconductor Devices	3 0 0	3
SCI	19PHY339	Astrophysics	3 0 0	3
		MATHEMATICS		
SCI	19MAT341	Statistical Inference	3 0 0	3
SCI	19MAT342	Introduction to Game Theory	3 0 0	3
SCI	19MAT343	Numerical Methods and Optimization	3 0 0	3

FREE ELECTIVES

		FREE ELECTIVES OFFERED UNDER MANAGEMENT STREAM		
Cat.	Code	Title	L T P	Credit
HUM	19MNG331	Financial Management	3 0 0	3
HUM	19MNG332	Supply Chain Management	3 0 0	3
HUM	19MNG333	Marketing Management	3 0 0	3
HUM	19MNG334	Project Management	3 0 0	3
HUM	19MNG335	Enterprise Management	3 0 0	3
HUM	19MNG338	Operations Research	3 0 0	3
HUM	19MEE401	Industrial Engineering	3 0 0	3
HUM	19MEE346	Managerial Statistics	3 0 0	3
HUM	19MEE347	Total Quality Management	3 0 0	3
HUM	19MEE342	Lean Manufacturing	3 0 0	3
HUM	19CSE358	Software Project Management	3 0 0	3
HUM	19CSE359	Financial Engineering	3 0 0	3
HUM	19CSE360	Engineering Economic Analysis	3 0 0	3
HUM	19MNG331	Financial Management	3 0 0	3
HUM	19CSE362	Information Systems	3 0 0	3

FREE ELECTIVES OFFERED UNDER HUMANITIES / SOCIAL SCIENCE STREAMS

Cat.	Code	Title	L T P	Credit
HUM	19CUL230	Achieving Excellence in Life - An Indian Perspective	2 0 0	2
HUM	19CUL231	Excellence in Daily Life	2 0 0	2
HUM	19CUL232	Exploring Science and Technology in Ancient India	2 0 0	2
HUM	19CUL233	Yoga Psychology	2 0 0	2
HUM	19ENG230	Business Communication	1 0 3	2
HUM	19ENG231	Indian Thought through English	2 0 0	2
HUM	19ENG232	Insights into Life through English Literature	2 0 0	2
HUM	19ENG233	Technical Communication	2 0 0	2
HUM	19ENG234	Indian Short Stories in English	2 0 0	2
HUM	19FRE230	Proficiency in French Language (Lower)	2 0 0	2
HUM	19FRE231	Proficiency in French Language (Higher)	2 0 0	2
HUM	19GER230	German for Beginners I	2 0 0	2
HUM	19GER231	German for Beginners II	2 0 0	2
HUM	19GER232	Proficiency in German Language (Lower)	2 0 0	2
HUM	19GER233	Proficiency in German Language (Higher)	2 0 0	2
HUM	19HIN101	Hindi I	2 0 0	2
HUM	19HIN111	Hindi II	2 0 0	2
HUM	19HUM230	Emotional Intelligence	2 0 0	2
HUM	19HUM231	Glimpses into the Indian Mind - the Growth of Modern India	2 0 0	2
HUM	19HUM232	Glimpses of Eternal India	2 0 0	2
HUM	19HUM233	Glimpses of Indian Economy and Polity	2 0 0	2

HUM	19HUM234	Health and Lifestyle	2 0 0	2
HUM	19HUM235	Indian Classics for the Twenty-first Century	2 0 0	2
HUM	19HUM236	Introduction to India Studies	2 0 0	2
HUM	19HUM237	Introduction to Sanskrit Language and Literature	2 0 0	2
HUM	19HUM238	National Service Scheme	2 0 0	2
HUM	19HUM239	Psychology for Effective Living	2 0 0	2
HUM	19HUM240	Psychology for Engineers	2 0 0	2
HUM	19HUM241	Science and Society - An Indian Perspective	2 0 0	2
HUM	19HUM242	The Message of Bhagwad Gita	2 0 0	2
HUM	19HUM243	The Message of the Upanishads	2 0 0	2
HUM	19HUM244	Understanding Science of Food and Nutrition	2 0 0	2
HUM	19JAP230	Proficiency in Japanese Language (Lower)	2 0 0	2
HUM	19JAP2313	Proficiency in Japanese Language (Higher)	2 0 0	2
HUM	19KAN101	Kannada I	2 0 0	2
HUM	19KAN111	Kannada II	2 0 0	2
HUM	19MAL101	Malayalam I	2 0 0	2
HUM	19MAL111	Malayalam II	2 0 0	2
HUM	19SAN101	Sanskrit I	2 0 0	2
HUM	19SAN111	Sanskrit II	2 0 0	2
HUM	19SWK230	Corporate Social Responsibility	2 0 0	2
HUM	19SWK231	Workplace Mental Health	2 0 0	2
HUM	19TAM101	Tamil I	2 0 0	2
HUM	19TAM111	Tamil II	2 0 0	2