



AMRITA
VISHWA VIDYAPEETHAM
—DEEMED TO BE UNIVERSITY—

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

SEMESTER II

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

SEMESTER III

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

SEMESTER IV

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

SEMESTER V

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

SEMESTER VI

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

SEMESTER VII

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

SEMESTER VIII

Cat.	Code	Title	Credit
PRJ	19ELC499	Project Phase II	10
		TOTAL	10

Total Credits		164
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***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	Credit
ENGG	19EEE331	Smart Grid and IoT	3
ENGG	19EEE335	Power Quality & FACTS	3
ENGG	19EEE337	Power System Management	3
ENGG	19EEE339	Power System Operation Control and Stability	3
ENGG	19EEE336	Power Converters	3
ENGG	19EEE338	Power Plant Instrumentation	3
ENGG	19EEE332	De-regulated power system	3
ENGG	19EEE341	Renewable energy and energy conservation	3
ENGG	19EEE344	Energy storage Systems	3
Cyber Physical Systems and Security			
Cat.	Code	Title	Credit
ENGG	19CSE331	Cryptography	3
ENGG	19CSE332	Information Security	3
ENGG	19CSE366	Cyber Security	3
ENGG	19CSE469	Information Retrieval	3
ENGG	19CSE470	Digital Forensics	3
Electro-Biological Systems			
Cat.	Code	Title	Credit
ENGG	19EEE430	Bio medical systems	3
ENGG	19EEE439	Bio Informatics	3
ENGG	19EEE451	Biological Control Systems	3
ENGG	19ECE331	Bio medical instrumentation	3
Automotive Systems			
Cat.	Code	Title	Credit
ENGG	19EEE432	Vehicular Networks and Communication	3
ENGG	19EEE433	E-mobility Business and Policies	3
ENGG	19EEE434	Automotive Electronics	3
ENGG	19EEE435	Automotive Control Systems	3
ENGG	19EEE436	Vehicle Dynamics and Control	3
ENGG	19EEE437	Electric Vehicle Technology	3

Embedded Systems, Robotics & Artificial Intelligence			
Cat.	Code	Title	Credit
ENGG	19CSE350	Internet of Things	3
ENGG	19CSE363	Artificial Intelligence	3
ENGG	19CSE367	Digital Image Processing	3
ENGG	19EEE352	Digital Control Systems	3
ENGG	19EEE353	Process Control and Instrumentation	3
ENGG	19EEE354	Introduction to Robotics	3
ENGG	19EEE355	Mechatronics	3
ENGG	19EEE358	Advanced Microcontrollers	3
ENGG	19EEE362	Deep Learning for Visual Computing	3
ENGG	19EEE363	Digital system design with FPGA	3
Advanced Computer Technologies			
Cat.	Code	Title	Credit
ENGG	19CSE349	Virtual Reality	3
ENGG	19CSE364	Big Data Analytics	3
ENGG	19CSE447	Cloud computing	3
ENGG	19CSE448	Block Chain	3
ENGG	19CSE449	Mobile applications and development	3
ENGG	19CSE450	Quantum Computing	3
ENGG	19CSE468	Web Technology and Applications	3

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

PROFESSIONAL ELECTIVES UNDER SCIENCE STREAM

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

FREE ELECTIVES

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

FREE ELECTIVES OFFERED UNDER HUMANITIES / SOCIAL SCIENCE STREAMS

Cat.	Code	Title	Credit
HUM	19CUL230	Achieving Excellence in Life - An Indian Perspective	2
HUM	19CUL231	Excellence in Daily Life	2
HUM	19CUL232	Exploring Science and Technology in Ancient India	2
HUM	19CUL233	Yoga Psychology	2
HUM	19ENG230	Business Communication	2
HUM	19ENG231	Indian Thought through English	2
HUM	19ENG232	Insights into Life through English Literature	2
HUM	19ENG233	Technical Communication	2
HUM	19ENG234	Indian Short Stories in English	2
HUM	19FRE230	Proficiency in French Language (Lower)	2
HUM	19FRE231	Proficiency in French Language (Higher)	2
HUM	19GER230	German for Beginners I	2
HUM	19GER231	German for Beginners II	2
HUM	19GER232	Proficiency in German Language (Lower)	2
HUM	19GER233	Proficiency in German Language (Higher)	2
HUM	19HIN101	Hindi I	2
HUM	19HIN111	Hindi II	2
HUM	19HUM230	Emotional Intelligence	2
HUM	19HUM231	Glimpses into the Indian Mind - the Growth of Modern India	2
HUM	19HUM232	Glimpses of Eternal India	2
HUM	19HUM233	Glimpses of Indian Economy and Polity	2
HUM	19HUM234	Health and Lifestyle	2
HUM	19HUM235	Indian Classics for the Twenty-first Century	2
HUM	19HUM236	Introduction to India Studies	2
HUM	19HUM237	Introduction to Sanskrit Language and Literature	2
HUM	19HUM238	National Service Scheme	2
HUM	19HUM239	Psychology for Effective Living	2
HUM	19HUM240	Psychology for Engineers	2

HUM	19HUM241	Science and Society - An Indian Perspective	2
HUM	19HUM242	The Message of Bhagwad Gita	2
HUM	19HUM243	The Message of the Upanishads	2
HUM	19HUM244	Understanding Science of Food and Nutrition	2
HUM	19JAP230	Proficiency in Japanese Language (Lower)	2
HUM	19JAP2313	Proficiency in Japanese Language (Higher)	2
HUM	19KAN101	Kannada I	2
HUM	19KAN111	Kannada II	2
HUM	19MAL101	Malayalam I	2
HUM	19MAL111	Malayalam II	2
HUM	19SAN101	Sanskrit I	2
HUM	19SAN111	Sanskrit II	2
HUM	19SWK230	Corporate Social Responsibility	2
HUM	19SWK231	Workplace Mental Health	2
HUM	19TAM101	Tamil I	2
HUM	19TAM111	Tamil II	2