



**AMRITA**  
**VISHWA VIDYAPEETHAM**  
DEEMED TO BE UNIVERSITY

School of  
Engineering

(AMRITAPURI, BANGALORE, COIMBATORE, CHENNAI)

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**B.Tech. in COMPUTER AND COMMUNICATION ENGINEERING**

**(BTC-CCE)**

**CURRICULUM 2019**

**SEMESTER I**

<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>Credit</b>
<b>SCI</b>	<b>19BIO101</b>	<b>Biology for Engineers - A</b>	<b>3</b>
<b>SCI</b>	<b>19MAT101</b>	<b>Single Variable Calculus</b>	<b>1</b>
<b>SCI</b>	<b>19MAT102</b>	<b>Matrix Algebra</b>	<b>2</b>
<b>ENGG</b>	<b>19CSE100</b>	<b>Problem Solving and Algorithmic Thinking</b>	<b>4</b>
<b>SCI</b>	<b>19PHY103</b>	<b>Physics of Electronic Materials</b>	<b>3</b>
<b>ENGG</b>	<b>19MEE100</b>	<b>Engineering Graphics - CAD</b>	<b>3</b>
<b>ENGG</b>	<b>19EEE100</b>	<b>Basic Electrical and Electronics Engineering</b>	<b>3</b>
<b>ENGG</b>	<b>19EEE181</b>	<b>Basic Electrical and Electronics Engineering Lab</b>	<b>1</b>
<b>ENGG</b>	<b>19ECE101</b>	<b>Introduction to Internet of Things</b>	<b>1</b>
<b>HUM</b>	<b>19CUL101</b>	<b>Cultural Education - I</b>	<b>2</b>
		<b>TOTAL</b>	<b>23</b>

**SEMESTER II**

<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>Credit</b>
<b>HUM</b>	<b>19ENG111</b>	<b>Technical Communication</b>	<b>3</b>
<b>SCI</b>	<b>19MAT111</b>	<b>Multivariable Calculus</b>	<b>2</b>
<b>SCI</b>	<b>19MAT112</b>	<b>Linear Algebra</b>	<b>3</b>
<b>SCI</b>	<b>19CHY102</b>	<b>Engineering Chemistry - B</b>	<b>3</b>
<b>SCI</b>	<b>19CHY182</b>	<b>Engineering Chemistry Lab - B</b>	<b>1</b>
<b>ENGG</b>	<b>19CSE102</b>	<b>Computer Programming</b>	<b>4</b>
<b>ENGG</b>	<b>19CCE101</b>	<b>Digital Design</b>	<b>4</b>
<b>ENGG</b>	<b>19CCE181</b>	<b>Digital Design Lab</b>	<b>1</b>
<b>ENGG</b>	<b>19MEE181</b>	<b>Manufacturing Practice</b>	<b>1</b>
<b>ENGG</b>	<b>19ECE181</b>	<b>Electronic Systems Lab</b>	<b>1</b>
<b>HUM</b>	<b>19CUL111</b>	<b>Cultural Education - II</b>	<b>2</b>
		<b>TOTAL</b>	<b>25</b>

**SEMESTER III**

<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>Credit</b>
<b>ENGG</b>	<b>19CCE201</b>	<b>Microcontrollers and Interfacing Techniques</b>	<b>4</b>
<b>ENGG</b>	<b>19CCE202</b>	<b>Data Structures and Algorithms</b>	<b>3</b>
<b>ENGG</b>	<b>19CCE203</b>	<b>Computational Electromagnetics</b>	<b>4</b>
<b>ENGG</b>	<b>19CCE204</b>	<b>Signal Processing</b>	<b>4</b>
<b>SCI</b>	<b>19MAT205</b>	<b>Probability and Random Processes</b>	<b>4</b>
<b>ENGG</b>	<b>19CCE281</b>	<b>Signal Processing Lab</b>	<b>1</b>
<b>ENGG</b>	<b>19CCE282</b>	<b>Data Structures Lab</b>	<b>1</b>
<b>HUM</b>	<b>19AVP201</b>	<b>Amrita Values Program I</b>	<b>1</b>
<b>HUM</b>	<b>19ENV300</b>	<b>Environmental Science</b>	<b>P/F</b>
		<b>TOTAL</b>	<b>22</b>

**SEMESTER IV**

<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>Credit</b>
<b>ENGG</b>	<b>19CCE211</b>	<b>Embedded Computing</b>	<b>3</b>
<b>ENGG</b>	<b>19CCE212</b>	<b>Multi rate Signal Processing &amp; Software Defined Radio</b>	<b>3</b>
<b>ENGG</b>	<b>19CCE213</b>	<b>Machine Learning and Artificial Intelligence</b>	<b>4</b>
<b>HUM</b>	<b>19AVP211</b>	<b>Amrita Values Program II</b>	<b>1</b>
<b>ENGG</b>	<b>19CCE214</b>	<b>Analog Communication Theory</b>	<b>4</b>
<b>SCI</b>	<b>19MAT213</b>	<b>Optimization Techniques</b>	<b>3</b>
<b>ENGG</b>	<b>19CCE283</b>	<b>Embedded Computing Lab</b>	<b>1</b>
<b>ENGG</b>	<b>19CCE284</b>	<b>Software Defined Radio Lab</b>	<b>1</b>
<b>HUM</b>	<b>19SSK211</b>	<b>Soft Skills I</b>	<b>2</b>
<b>HUM</b>	<b>19LAW300</b>	<b>Indian Constitution</b>	<b>P/F</b>
		<b>TOTAL</b>	<b>22</b>

**SEMESTER V**

Cat.	Code	Title	Credit
ENGG	19CCE301	Internet of Things	3
ENGG	19CCE303	Digital Communication	4
ENGG	19CCE304	Computer Networks	4
ENGG	19CCE302	Computer Systems and Architecture	3
ENGG		Professional Elective I*	3
ENGG	19CCE391	Seminar	1
ENGG	19CCE381	IoT and Computing Lab	1
ENGG	19CCE382	Communication Systems Design Lab	1
HUM	19SSK301	Soft Skills II	2
ENGG	19LIV390	Live-in –Labs***	[3]
		TOTAL	22

**SEMESTER VI**

Cat.	Code	Title	Credit
ENGG	19CCE311	Wireless Communication	4
ENGG	19CCE312	Cyber-Physical Systems: Design, Modeling and Simulation	4
ENGG	19CCE313	RF System Design	3
ENGG		Professional Elective II*	3
ENGG		Professional Elective III*	3
ENGG	19CCE383	Electromagnetic Simulation Lab	1
ENGG	19CCE384	Design and Innovation Lab	1
HUM	19SSK311	Soft Skills III	2
ENGG	19LIV490	Live-in –Labs***	[3]
HUM	19MNG300	Disaster Management	P/F
		TOTAL	21

**SEMESTER VII**

Cat.	Code	Title	Credit
ENGG		Professional Elective IV*	3
ENGG		Professional Elective V*	3
ENGG		Professional Elective VI*	3
HUM		Free Elective**	2
HUM		Free Elective**	2
PRJ	19CCE495	Project Phase I	2
		<b>TOTAL</b>	<b>15</b>

**SEMESTER VIII**

Cat.	Code	Title	Credit
ENGG		Professional Elective VII*	3
PRJ	19CCE499	Project Phase II	10
		<b>TOTAL</b>	<b>13</b>

		<b>TOTAL CREDITS</b>		<b>163</b>
--	--	----------------------	--	------------

**\*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**

<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>Credit</b>
<b>Computational Engineering</b>			
ENGG	19CCE331	Markov Process and Queuing Theory	3
ENGG	19CCE332	Operations Research	3
ENGG	19CCE333	Convex Optimization	3
ENGG	19CCE334	Deep Learning	3
ENGG	19CCE335	Bio-inspired Algorithms	3
ENGG	19CCE336	Game Theory	3
ENGG	19CCE337	Pattern Recognition	3
ENGG	19CCE338	Signal Processing for Business Applications	3
ENGG	19CCE339	Non-linear Dynamics and Chaos	3
ENGG	19CCE340	Agent Based Modeling	3
ENGG	19CCE341	Robotics	3
<b>Communication Engineering</b>			
ENGG	19CCE431	Software Defined Networks	3
ENGG	19CCE432	Orthogonal Frequency Division Multiplexing	3
ENGG	19CCE433	Multiple Input Multiple Output Communication	3
ENGG	19CCE434	Spread Spectrum Communication	3
ENGG	19CCE435	Wireless Sensor Networks	3
ENGG	19CCE436	Mobile Communication	3
ENGG	19CCE437	Vehicular Communication	3
ENGG	19CCE438	Millimeter Wave Personal Communication Systems	3
ENGG	19CCE439	Telecommunication Management	3
ENGG	19CCE440	Avionics	3
ENGG	19CCE441	Antenna Systems	3
ENGG	19CCE442	Planar Microwave Devices	3
ENGG	19CCE443	Satellite Communication	3
ENGG	19CCE444	Spoken Language Processing	3

ENGG	19CCE445	Radar Signal Processing	3
ENGG	19CCE446	Statistical Signal Processing	3
ENGG	19CCE447	Image Processing	3
ENGG	19CCE448	Biomedical Signal Processing	3
ENGG	19CCE449	Hyperspectral Image Analysis	3
ENGG	19CCE450	Wavelets and Application	3
ENGG	19CCE451	Adaptive Signal Processing	3

Computer Science Engineering			
ENGG	19CSE471	Principles of Operating Systems	3
ENGG	19CSE463	Mobile Application Development	3
ENGG	19CSE464	Fundamentals of Software Engineering	3
ENGG	19CSE465	Introduction to Big Data Analytics	3
ENGG	19CSE466	Foundation of Information Technology	3
ENGG	19CSE467	Principles of Database Management Systems	3
ENGG	19CSE477	Principles of Computer Networks	3
ENGG	19CSE201	Advanced Programming	3
ENGG	19CSE204	Object Oriented Paradigm	3

**PROFESSIONAL ELECTIVES UNDER SCIENCE STREAM**

<b>CHEMISTRY</b>			
<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>Credit</b>
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
<b>PHYSICS</b>			
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
<b>Mathematics</b>			
SCI	19MAT341	Statistical Inference	3
SCI	19MAT342	Introduction to Game Theory	3
SCI	19MAT343	Numerical Methods and Optimization	3

**FREE ELECTIVES**

<b>FREE ELECTIVES OFFERED UNDER MANAGEMENT STREAM</b>			
<b>Cat.</b>	<b>Code</b>	<b>Title</b>	<b>Credit</b>
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