



AMRITA
VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY

School of
Engineering

(AMRITAPURI, BANGALORE, COIMBATORE, CHENNAI)

**B.Tech. in COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE)**

(BTC-AIE)

CURRICULUM 2019

SEMESTER 1

Cat.	Code	Title	L T P	Credit
SCI	19MAT105	Mathematics for Intelligent Systems 1	2 0 3	3
SCI	19PHY104	Computational Engineering Mechanics 1	2 0 3	3
ENGG	19AIE105	Object Oriented Programming	2 1 3	4
ENGG	19AIE101	Elements of Computing Systems 1	2 0 3	3
ENGG	19AIE104	Introduction to Electrical Engineering	2 0 3	3
SCI	19BIO103	Intelligence of Biological Systems 1	1 0 3	2
ENGG	19AIE102	Introduction to Digital Manufacturing	1 0 3	2
ENGG	19AIE103	Introduction to Drones	1 0 3	2
HUM	19CUL101	Cultural Education I	2 0 0	2
		TOTAL	28	24

SEMESTER II

Cat.	Code	Title	L T P	Credit
SCI	19MAT117	Mathematics for Intelligent Systems 2	2 0 3	3
SCI	19PHY113	Computational Engineering Mechanics 2	2 0 3	3
ENGG	19AIE114	Principles of Measurements & Sensors	1 1 3	3
ENGG	19AIE111	Data Structures & Algorithms 1	2 1 3	4
ENGG	19AIE112	Elements of Computing Systems - 2	2 0 3	3
ENGG	19AIE113	Introduction to Electronics	2 0 3	3
SCI	19BIO112	Intelligence of Biological Systems 2	1 0 3	2
HUM	19CUL111	Cultural Education II	2 0 0	2
HUM	19ENG111	Technical Communication	2 0 3	3
		TOTAL	28	26

SEMESTER III

Cat.	Code	Title	L T P	Credit
SCI	19MAT204	Mathematics for Intelligent Systems 3	2 0 3	3
ENGG	19AIE201	Introduction to Robotics	1 2 0	3
ENGG	19AIE202	Operating Systems	2 1 3	4
ENGG	19AIE203	Data Structures & Algorithms 2	2 1 3	4
ENGG	19AIE204	Introduction to Communication Systems	1 2 0	3
ENGG	19BIO201	Intelligence of Biological Systems 3	1 2 0	3
ENGG	19AIE205	Python for Machine Learning	0 0 3	1
HUM	19LAW300	Indian Constitution		P/F
HUM	19AVP201	Amrita Values Program-1	1 0 0	1
		TOTAL	28	22

SEMESTER IV

Cat.	Code	Title	L T P	Credit
SCI	19MAT212	Mathematics for Intelligent Systems 4	2 0 3	3
ENGG	19AIE211	Introduction to Computer Networks	2 0 3	3
ENGG	19AIE212	Design and Analysis of Algorithms	2 0 3	3
ENGG	19AIE213	Robotic Operating Systems & Robot Simulation	2 0 3	3
ENGG	19AIE214	Bigdata Analytics	2 0 3	3
ENGG	19BIO211	Intelligence of Biological Systems 4	1 2 0	3
HUM	19AVP211	Amrita Values Program-2	1 0 0	1
HUM	19ENV300	Environmental Science		P/F
HUM	19SSK211	Soft Skills I	1 0 2	2
		TOTAL	26	21

SEMESTER V

Cat.	Code	Title	L T P	Credit
SCI	19MAT301	Mathematics for Intelligent Systems 5	2 0 3	3
ENGG	19AIE301	Formal language and Automata	2 0 3	3
ENGG	19AIE302	Advanced Computer Networks	2 0 3	3
ENGG	19AIE303	Signal & Image Processing	2 0 3	3
ENGG	19AIE304	Big Data and Database Management	2 0 3	3
ENGG		Professional Elective 1*/Live-in Labs***	2 1 0	3
HUM	19SSK301	Soft. Skills II	1 0 2	2
HUM	19MNG300	Disaster Management		P/F
		TOTAL	23	20

SEMESTER VI

Cat.	Code	Title	L T P	Credit
SCI	19MAT311	Mathematics for Intelligent Systems 6	2 0 3	3
ENGG	19AIE311	Reinforcement Learning	2 0 3	3
ENGG	19AIE312	Deep Learning for Signal & Image Processing	2 0 3	3
ENGG	19AIE313	Introduction to Modern Compiler Design	2 0 0	2
ENGG		Professional Elective 2*/Live in labs ***	1 2 0	3
ENGG	19AIE314	AI in Natural Language Processing	2 0 3	3
ENGG	19AIE315	AI in Speech Processing	2 0 3	3
HUM	19SSK311	Soft Skills II	1 0 2	2
		TOTAL	25	22

SEMESTER VII

Cat.	Code	Title	L T P	Credit
ENGG	19AIE401	Deep Reinforcement Learning	1 2 0	3
ENGG		Professional Elective 3*	2 1 0	3
ENGG		Professional Elective 4*	2 1 0	3
ENGG		Free Elective 1**	2 0 0	2
ENGG		Free Elective 2**	2 0 0	2
ENGG	19AIE495	Mini Project	0 0 6	2
		TOTAL	18	15

SEMESTER VIII

Cat.	Code	Title	L T P	Credit
PRJ	19AIE499	Dissertation	0 0 30	10
		TOTAL	30	10

		Total Credits	160	
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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

Pool 1: AI in Cyber Security				
Cat.	Code	Title	L T P	Credit
ENGG	19AIE431	Applied Cryptography	1 2 0	3
ENGG	19AIE432	Network and Wireless Security	1 2 0	3
ENGG	19AIE433	Intrusion Detection and Prevention Systems	1 2 0	3
ENGG	19AIE434	Software Vulnerability Analysis	1 2 0	3
ENGG	19AIE435	Cybercrime Forensics and Digital Forensics	1 2 0	3
ENGG	19AIE436	Distributed System Security	1 2 0	3

Pool 2: AI in Healthcare				
Cat.	Code	Title	L T P	Credit
ENGG	19AIE451	Computational Healthcare	1 2 0	3
ENGG	19AIE452	Basics of Drug Design	1 2 0	3
ENGG	19AIE453	Deep learning in Genomics and Biomedicine	1 2 0	3
ENGG	19AIE454	Clinical Information Systems	1 2 0	3
ENGG	19AIE455	CRISPR Technology	1 2 0	3
ENGG	19AIE456	DNA Sequencing	1 2 0	3

Pool 3: AI in Robotics				
Cat.	Code	Title	L T P	Credit
ENGG	19AIE441	Kinematics and Kinetics for Robotics	1 2 0	3
ENGG	19AIE442	Robotics Vision	1 2 0	3
ENGG	19AIE443	Dynamics and Control of Robotics	1 2 0	3
ENGG	19AIE444	Sensors for Robotics	1 2 0	3
ENGG	19AIE445	Application of Robotics	1 2 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