AMRITA
VISHWA VIDYAPEETHAM
श्रद्धावान् लभते ज्ञानम्
——— 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	Credit
SCI	19MAT105	Mathematics for Intelligent Systems 1	3
SCI	19PHY104	Computational Engineering Mechanics 1	3
ENGG	19AIE105	Object Oriented Programming	4
ENGG	19AIE101	Elements of Computing Systems 1	3
ENGG	19AIE104	Introduction to Electrical Engineering	3
SCI	19BIO103	Intelligence of Biological Systems 1	2
ENGG	19AIE102	Introduction to Digital Manufacturing	2
ENGG	19AIE103	Introduction to Drones	2
HUM	19CUL101	Cultural Education I	2
		TOTAL	24

SEMESTER II

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

SEMESTER III

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

SEMESTER IV

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

SEMESTER V

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

SEMESTER VI

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

SEMESTER VII

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

SEMESTER VIII

Cat.	Code	Title	Credit
PRJ	19AIE499	Dissertation	10
		TOTAL	10

		Total Credits	160	

*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 Secuity			
Cat.	Code	Title	Credit
ENGG	19AIE431	Applied Cryptography	3
ENGG	19AIE432	Network and Wireless Security	3
ENGG	19AIE433	Intrusion Detection and Prevention Systems	3
ENGG	19AIE434	Software Vulnerability Analysis	3
ENGG	19AIE435	Cybercrime Forensics and Digital Forensics	3
ENGG	19AIE436	Distributed System Security	3

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

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

PROFESSIONAL ELECTIVES UNDER SCIENCE STREAM

Cat.	Code	Title	Credit
		CHEMISTRY	
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

Cat.	Code	Title	Credit
		FREE ELECTIVES OFFERED UNDER HUMANITIES / SOCIAL SCIENCE STREAMS	
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