B Tech Curriculum – 2022

Flexible Total Credits: 160/168/180/188
Mandatory Learning Courses (MLC): 12 Credits (2+9+1)
Flexible Core - Choice Based Credit System (CBCS)
Provisions for awarding credits to students for their performance in NCC and Major Projects (optional) - OEs
Scope for Component level Self Directed Learning (SDL) in a few courses
Mandatory Mini Project for Minor Specialization

ACADEMIC YEAR	NO. OF CREDITS	REMARKS
FIRST	22 + 22 = 44	EG-I & EG-II – 1 credit each Universal Human Values & professional ethics– 1 credit Human Rights and Constitution – 1 credit
SECOND	22 + 21 = 43	ODD SEM: Core + Labs EVEN SEM: Core + Labs
THIRD	21 + 21 = 42	ODD SEM: FLEXIBLE Core + Labs + OE EVEN SEM: FLEXIBLE Core + OE + PEs + Labs CHOICE BASED CREDIT SYSTEM FOR CORE COURSES MANDATORY OE - CPI
FOURTH	18 + 13 = 31	ODD SEM: PEs + OE EVEN SEM: Project Work/Practice School, Industrial Training

FIRST YEAR B Tech CURRICULUM 2022 (Common to all branches)

PHYSICS CYCLE

Year	FIRST SEMESTER						SECOND SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
I		Engineering mathematics - I	3	1	0	4		Engineering mathematics - II	3	1	0	4
		Engineering Physics	2	1	0	3		Engineering Chemistry	2	1	0	3
		Mechanics of Solids	2	1	0	3		Biology for Engineers	3	0	0	3
		Basic Electronics	2	1	0	3		Basic Electrical Technology	2	1	0	3
		Basic Mechanical Engineering	2	1	0	3		Problem Solving Using Computers	2	1	0	3
		Communication Skills in English	2	0	0	2		Environmental Studies	2	0	0	2
		Universal Human Values and Professional Ethics (MLC)	1	0	0	1		Human Rights and Constitution (MLC)	1	0	0	1
		Engineering Physics Lab	0	0	3	1		Engineering Chemistry Lab	0	0	3	1
		Workshop Practice	0	0	3	1		PSUC Lab	0	0	3	1
		Engineering Graphics - I	0	0	3	1		Engineering Graphics - II	0	0	3	1
		Creativity, Problem Solving & Innovation*(MLC)	1	0	0	--*		Creativity, Problem Solving & Innovation* (MLC)	1	0	0	--*
			15	**5**	**9**	**22**			**16**	**4**	**9**	**22**
	Total Contact Hours (L + T + P)		**29**				**Total Contact Hours (L + T + P)**		**29**			

*After completing a project work along with other activities which are assessed periodically the students would earn 3 credits which would be considered in lieu of an open elective for Fifth semester B Tech

FIRST YEAR B Tech CURRICULUM 2022 (Common to all branches)

CHEMISTRY CYCLE

Year	FIRST SEMESTER						SECOND SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
I		Engineering mathematics - I	3	1	0	4		Engineering mathematics - II	3	1	0	4
		Engineering Chemistry	2	1	0	3		Engineering Physics	2	1	0	3
		Biology for Engineers	3	0	0	3		Mechanics of Solids	2	1	0	3
		Basic Electrical Technology	2	1	0	3		Basic Electronics	2	1	0	3
		Problem Solving Using Computers	2	1	0	3		Basic Mechanical Engineering	2	1	0	3
		Environmental Studies	2	0	0	2		Communication Skills in English	2	0	0	2
		Human Rights and Constitution (MLC)	1	0	0	1		Universal Human Values and Professional Ethics (MLC)	1	0	0	1
		Engineering Chemistry Lab	0	0	3	1		Engineering Physics Lab	0	0	3	1
		PSUC Lab	0	0	3	1		Workshop Practice	0	0	3	1
		Engineering Graphics – I	0	0	3	1		Engineering Graphics - II	0	0	3	1
		Creativity, Problem Solving & Innovation (MLC)*	1	0	0	--*		Creativity, Problem Solving & Innovation (MLC)*	1	0	0	--*
			16	**4**	**9**	**22**			**15**	**5**	**9**	**22**
	Total Contact Hours (L + T + P)		**29**				**Total Contact Hours (L + T + P)**		**29**			

*After completing a project work along with other activities which are assessed periodically the students would earn 3 credits which would be considered in lieu of the open elective for Fifth semester B Tech

B Tech in Cyber Physical System

Year	THIRD SEMESTER						FOURTH SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
II	MAT ****	Engineering Mathematics - III	2	1	0	3	MAT ****	Engineering mathematics - IV	2	1	0	3
	ICE ****	Core – 1 Analog Electronic Circuits	3	1	0	4	ICE ****	Core – 6 Microcontroller	3	1	0	4
	ICE ****	Core – 2 Digital Logic Design	3	0	0	3	ICE ****	Core –7 Digital Transmission	3	0	0	3
	ICE ****	Core – 3 Computer Architecture and Organization	3	0	0	3	ICE ****	Core – 8 Introduction of Cyber Physical Systems	3	0	0	3
	ICE ****	Core – 4 Data Structures and Algorithms	3	1	0	4	ICE ****	Core – 9 Communication systems	3	0	0	3
	ICE ****	Core – 5 Sensor Technology	3	0	0	3	ICE ****	Core – 10 Control Systems	3	0	0	3
	ICE ****	Lab – 1 Sensors and Circuit Lab	0	0	3	1	ICE ****	Lab – 3 Communication Networks lab	0	0	3	1
	ICE ****	Lab – 2 Data Structure Lab	0	0	3	1	ICE ****	Lab – 4 Microcontroller Lab	0	0	3	1
			17	**3**	**6**	**22**			**17**	**2**	**6**	**21**
	Total Contact Hours (L + T + P)		**26**				**Total Contact Hours (L + T + P)**		**25**			

B Tech in Cyber Physical Systems

Year	FIFTH SEMESTER						SIXTH SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
III	HUM ****	HUM – 1 EOM	3	0	0	3	HUM ****	HUM – 2 EEFM	3	0	0	3
	ICE ****	Core – 11 Cyber Physical system design	3	1	0	4	ICE ****	Flexible Core – 2 (Unsupervised intelligence in CPS/ Design of Safe systems)*	3	0	0	3
	ICE ****	Core – 12 Data Communication and networks	3	1	0	4	ICE ****	Flexible Core – 3 (CPS Interface/ Automation)*	3	0	0	3
	ICE ****	Core – 13 Embedded systems design and programming	3	0	0	3	ICE ****	PE – 1 / Minor Specialization	3	0	0	3
	ICE ****	Flexible Core – 1 (Industry 4.0 / Smart Sensor/ VLSI Design)*	3	0	0	3	ICE ****	PE – 2 / Minor Specialization	3	0	0	3
	ICE ****	OE – Creativity, Problem Solving and Innovation** (MLC) - mandatory	3	0	0	3	ICE ****	OE – 1** (MLC)	3	0	0	3
	ICE ****	Lab – 5 Cyber physical systems design Lab	0	0	3	1	ICE ****	Lab – 7 CPS Interface Lab	0	0	3	1
	ICE ****	Lab – 6 Embedded system programming Lab	0	0	3	1	ICE ****	Lab – 8 Networking lab	0	0	3	1
			18	**2**	**6**	**22**			**18**	**0**	**6**	**20**
	Total Contact Hours (L + T + P)		**26**				**Total Contact Hours (L + T + P)**		**24**			

*Courses of three independent tracks A, B, C

** Performance of students to be recorded in Eighth semester grade sheet

B Tech in Cyber Physical Systems

Year	SEVENTH SEMESTER						EIGHTH SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
IV	ICE ****	PE – 3 / Minor Specialization	3	0	0	3	ICE ****	Industrial Training (MLC)				1
	ICE ****	PE – 4 / Minor Specialization	3	0	0	3	ICE ****	Project Work				12
	ICE ****	PE – 5	3	0	0	3	ICE ****	Project Work (B Tech – honours)* (V - VIII sem)				20
	ICE ****	PE – 6	3	0	0	3	ICE ****	B Tech – honours Theory – 1* (V semester)				4
	ICE ****	PE - 7	3	0	0	3	ICE ****	B Tech – honours Theory – 2* (VI semester)				4
	ICE ****	OE – 2** (MLC)	3	0	0	3	ICE ****	B Tech – honours Theory – 3* (VII semester)				4
	ICE ****	Mini Project (Minor specialization)***				8						
			18	**0**	**0**	**18/26*** **						**13/33***
	Total Contact Hours (L + T + P)		**18**				**Total Contact Hours (L + T + P)**					

*Applicable to eligible students who opted for and successfully completed the B Tech – honours requirements

** Performance of students to be recorded in Eighth semester grade sheet

***Applicable to students who opted for minor specialization

Minor Specialization		Other Electives
I. Computational Intelligence ELE **** : Artificial Intelligence ECE **** : Computer Vision ECE **** : Machine Learning ELE **** : Soft Computing Techniques **II. Control Systems** ICE **** : Modern Control Theory ICE **** : Nonlinear control theory ICE **** : Digital Control Systems ICE **** : System Identification **III. Embedded Systems** ECE **** : Embedded System Design ELE **** : FPGA based system Design ECE **** : Internet of Things ELE **** : Real Time Systems **IV. Illumination Technology** ELE **** : Integrated Lighting Design ELE **** : Lighting Controls: Technology & Applications ELE **** : Lighting Science: Devices and Systems ELE **** : Solid State Lighting **V. Sensor Technology** ICE **** : Sensor Design ICE **** : Biosensors and BioMEMS ICE **** : Multi Sensor Data Fusion ICE **** : Automotive Sensors **VI. Systems Engineering** ICE ****: Introduction to Systems Engineering ICE ****: System architecture and Design ICE ****: Introduction to SysML and MBSE ICE ****: System Verification and validation	**VII. Signal Processing** ECE **** : Advanced Digital Signal Processing ELE **** : Digital Image Processing ECE **** : Digital Speech Processing ELE **** : Linear Algebra for Signal Processing **VIII. VLSI Design** ECE **** : Analog & Mixed Signal Design ECE **** : Digital Design Verification ECE **** : Low power VLSI Design ECE **** : Semiconductor Device Theory **IX. Business Management** HUM **** : Financial Management HUM **** : Human Resource Management HUM **** : Marketing Management HUM **** : Operation Management **X. Smart Transportation Systems** ICE **** : Automotive Electronics ICE **** : In-vehicle Networking ICE **** : Intelligent Transportation Systems ICE **** : Advanced Driver Assistance Systems	ICE **** : Cyber Security ICE **** : Wireless Sensor Technology ICE **** : Blockchain Technology ICE **** : Intelligent Manufacturing Automation ICE **** : Smart Grid ICE **** : CPS Assurance ICE **** : Next Generation Networks ICE **** : Design Of Safe Systems ICE **** : Virtual and Augmented Reality ICE **** : Metaverse ICE **** : Smart Infrastructure ICE **** : E-Vehicles ICE **** : Big Data Analytics ICE **** : Smart Farming and Agriculture ICE **** : Business Models For Cyber Physical Systems ICE **** : CPS for internal and external security **Open Electives** ICE **** : Feedback Control Theory ICE **** : Industrial Automation ICE **** : Industrial Instrumentation ICE **** : Sensor Technology ICE **** : Smart Sensor ICE **** : Virtual Instrumentation ICE**** : Farm Automation