Curriculum Version 1.0

B.Tech. (Embedded System & VLSI)

(For AY2026-27 onwards)

Credit distribution among baskets (Minimum credits to be earned = 160)		
Sl. No.	**Baskets**	**Credit Contribution**
1	School Core	59
2	Program Core	40
3	Discipline Elective	43
	Common Electives Basket	25
	Specialized Elective Baskets*	18
4	Open Elective	18
	Total Credits	**160**

Specialized Elective Baskets*		
Sl.No.	**Name of the Basket**	**Minimum Credit Requirement**
1	AI & ML	3
2	Signal Processing	3
3	Communication and Networking	3
4	VLSI and Embedded Systems	3
5	IoT	3
6	Robotics and Automation	3
Total*		**18**

**** Remaining Credits, if any, to satisfy Specialized Elective Baskets credit requirement can be taken from any Specialized Elective Basket***

Sl. No.	Course Code	Course Name	L	P	Credits
A. School Core - Minimum Credits to be earned from this basket =					**59**
1	MAT1014	Linear Algebra and Calculus Using Matlab	3	2	**4**
2	MAT1002	Differential Equations and Transform Techniques	3	0	**3**
3	MAT1013	Statistics and Probability	2	2	**3**
4	MAT1012	Numerical Techniques	2	2	**3**
5	CSE1017	Programming in C and C++	2	4	**4**
6	CSE1018	Object Oriented Programming with Java	2	4	**4**
7	CSE1037	Programming in Python	2	2	**3**
8	CSE2001	Data Structures and Algorithms	3	2	**4**
9	ECE1008	Innovation Project using Arduino	0	2	**1**
10	ECE1009	Innovation Project using Rasberry Pi	0	2	**1**
11	BIT1002	Basic Human Nutrition	2	0	**2**
12	MGT1101	Digital Entrepreneurship	2	0	**2**
13	ECE4001	B.Tech. Capstone Project	-	-	**4**
14	ECE4002	B.Tech. Internship	-	-	**6**
B. Electrical and Electronics Basket - Min. credits to be earned from this basket =					**4**
1	ECE1001	Fundamentals of Electrical and Electronics Engineering	3	2	**4**
2	ECE1002	Elements of Electronics Engineering	3	2	**4**
C.Modern Physics Basket - Min. credits to be earned from this basket =					**3**
1	PHY1002	Semiconductor Physics	2	2	**3**
2	PHY1001	Physics of Opto-electronic devices	2	2	**3**
D.English Basket - Min. credits to be earned from this basket =					**2**
1	ENG1001	Foundational English	0	2	**1**
2	ENG1002	Communicative English	0	2	**1**
3	ENG1003	Professional English	0	2	**1**
E.Foreign Languages Basket - Min. credits to be earned from this basket =					**2**
1	FRE1002	Communicative French	2	0	**2**
2	GER1002	Communicative German	2	0	**2**
3	SPA1001	Communicative Spanish	0	2	**1**
F. Behavioural Science Basket (All Courses in this basket are mandatory) - Minimum Credits to be earned from this basket =					**2**
1	PSY1001	Understanding Self for Effectiveness	0	2	**1**
2	PSY1002	Dynamics of Human Behaviour	0	2	**1**
G.Soft skill Basket (All Courses in this basket are mandatory) - Minimum Credits to be earned from this basket =					**2**
1	SSK2002	Being Corporate Ready	0	2	**1**
2	SSK3001	Problem Solving through Aptitude	0	2	**1**
3	CSE3050	Programming Skills for Employment	0	2	**1**
Non-Credit Pass/ Fail Type Courses					**0**
2	CHE1001	Environmental Studies	2	0	**0**
3	CEA1001	Co-/ Extra-curricular Activities	-	-	**-**

Program Core (All Courses in this basket are mandatory) - Minimum Credits to be earned from this basket =					**40**
1	ECE2031	Signals and Systems	2	2	**3**
2	ECE2032	Circuit Theory and control systems	2	2	**3**
3	ECE1006	Digital Design and Modelling	2	2	**3**
4	ECE1007	Microprocessors and Microcontrollers	2	2	**3**
5	ECE2034	Analog Circuits	2	2	**3**
6	ECE3001	Digital Signal Processing	2	2	**3**
7	ECE3002	VLSI System Design	2	2	**3**
8	ECE2033	Embedded System Design	2	2	**3**
9	CSE1035	Fundamentals of Artificial Intelligence and Machine Learning	2	2	**3**
10	ECE2006	Computer Architecture and Organization	3	0	**3**
11	ECE2039	Real Time Operating System	3	0	**3**
12	ECE3015	VLSI Testing and Verification	2	2	**3**
13	CSE2002	Web Technology	2	2	**3**
14	CSE2015	Source Code Management	0	2	**1**
Discipline Electives - Minimum Credits to be earned from both Common and Specialized elective baskets =					**43**
Common Electives Basket - Minimum Credits to be earned from this basket =					**25**
1	ECE3010	FPGA and ASIC Design	2	2	**3**
2	ECE3011	Low Power VLSI Design	2	2	**3**
3	ECE3036	System and Network on chip	3	0	**3**
4	ECE2012	Microelectronic Systems	2	2	**3**
5	ECE2013	Nano technology	2	2	**3**
6	ECE2014	Smart devices - IoT	2	2	**3**
7	ECE2015	Fundamentals of Electric Vehicle Technology	2	2	**3**
8	ECE3005	Quantum Technology	2	2	**3**
9	ECE3006	Mixed Signal Circuit Design	2	2	**3**
10	ECE3007	Neuromorphic Computing	2	2	**3**
11	ECE1005	Fundamentals of Electrical Engineering	2	2	**3**
12	ECE3008	Universal Verification Methodology	2	2	**3**
13	ECE2017	Semiconductor Fabrication	3	0	**3**
14	ECE2018	Introduction to MEMS	2	2	**3**
15	ECE2007	Wireless and Mobile Communications	2	2	**3**
16	ECE3012	Scripting Languages and Verification	2	2	**3**
17	ECE3013	Semiconductor Device Modelling	2	2	**3**
18	ECE3014	CAD for IC Design	2	2	**3**
19	ECE3034	Analog IC Design	2	2	**3**
20	ECE3035	Digital IC Design	2	2	**3**
21	ECE2024	Embedded Network Protocols	3	0	**3**
22	ECE2022	Wearable Technology	3	0	**3**
23	ECE3016	Machine Learning for Embedded Applications	2	2	**3**
24	ECE2020	Cyber physical system	3	0	**3**
25	ECE2038	FPGA Programming	2	2	**3**

26	ECE2037	Embedded Programming	2	2	**3**
27	ECE2019	System Verilog	**2**	**2**	**3**
28	ECE2023	Digital Image Transformations	**2**	**2**	**3**
29	ECE1004	Engineering Electromagnetics	2	0	2
30	ECE2009	Analog and Digital Communication	3	2	4
31	ECE2008	Data Communications and Networks	2	2	3
32	ECE2025	AUTOSAR and In-Vehicle Networking	3	0	**3**
Specialized Electives Baskets - Minimum Credits to be earned from these baskets =					**18**
H. AI & ML Basket - Minimum Credits to be earned from this basket =					**3**
1	CSE3010	AI & ML Applications	2	2	3
2	CSE3011	Machine Learning Techniques	2	2	3
3	CSE3015	Natural Language Processing	2	2	3
4	CSE3013	Deep Neural Networks	2	2	3
5	CSE3012	Optimization Techniques in Machine Learning	3	0	3
6	CSE3014	Reinforcement Learning Techniques	2	2	3
7	CSE4005	Industrial Applications of AI & ML	3	0	3
I. Signal Processing Basket - Minimum Credits to be earned from this basket =					**3**
1	ECE2026	Artificial Intelligence for Signal Processing	2	2	**3**
2	ECE2027	Image and Video Processing	2	2	**3**
3	ECE3018	Speech Recognition and Natural Language Processing	2	2	**3**
4	ECE2028	Biomedical Signal Processing	2	2	**3**
5	ECE3019	Adaptive Signal Processing	2	2	**3**
6	ECE3020	Multirate and non linear Signal Processong	2	2	**3**
7	ECE4003	Industrial Applications of Signal Processing	3	**0**	3
J. Communication and Networking Basket - Minimum Credits to be earned from this basket =					**3**
1	ECE2029	Satellite Communication	2	2	**3**
2	ECE3021	Cognitive Radio Networks	2	2	**3**
3	ECE2030	Wireless Sensor Network	2	2	**3**
4	ECE3022	Advanced Radar Communication	2	2	**3**
5	ECE3024	Optical wireless communication system	2	2	**3**
6	ECE3025	Advanced MIMO for 5G and beyond	2	2	**3**
7	ECE4004	Industrial Applications of Communication and Networking	3	0	**3**
K. VLSI and Embedded Systems Basket - Minimum Credits to be earned from this basket =					**3**
1	ECE3026	Hardware Security in VLSI	2	2	**3**
2	ECE3027	Machine Learning for VLSI Design	2	2	**3**
3	ECE3028	Emerging memory devices	2	2	**3**
4	ECE3029	CMOS RFIC Design	2	2	**3**
5	ECE3030	Advanced VLSI architectures	2	2	**3**
7	ECE3031	Advanced Packaging Technologies	2	2	**3**
8	ECE3032	AI Circuits	2	2	**3**
9	ECE3033	Principles of Nanomaterials and QuantumDots	2	2	**3**
10	ECE4005	Industrial Applications of Advanced VLSI Design	3	0	3
L. IoT Basket - Minimum Credits to be earned from this basket =					**3**

1	ECE2004	Sensor Technology, Embedded Systems and User Interface	2	2	**3**
2	ECE2002	IoT Platforms and Application Development	2	2	**3**
3	CSE2031	Wireless Communication in IoT	3	0	**3**
4	ECE2001	IoT Architecture and Protocols	3	0	**3**
5	CSE2032	Mobile Application for IoT	2	2	**3**
6	CSE2033	Cloud Computing for IoT	3	0	**3**
7	CSE2030	Big Data Analytics for IoT	2	2	**3**
8	ECE2003	Industrial Internet of Things	3	0	**3**
9	ECE2005	Internet of Medical Things	3	0	**3**
M. Robotics Basket - Minimum Credits to be earned from this basket =					**3**
1	ECE5002	Principles of Robotics and RoS	2	2	3
2	ECE2037	Drone Technology	2	2	3
3	CSE5096	Robotic Process Automation	2	2	3
4	CSE5099	Robot Motion Planning	2	2	3
5	ECE5005	Robot Kinematics	2	2	3
6	ECE3023	Mechatronic System Design	2	2	3
7	CSE5098	Computer Vision	2	2	3
8	ECE3026	Building Robots	0	6	3
9	CSE3031	Autonomous Mobile Robots	2	2	3
10	CSE3032	Human-robot Interaction	2	2	3
11	CSE3033	Microrobotics	3	0	3
12	CSE4004	Industrial Applications of Robotics	3	0	3

Common Electives Basket - Minimum Credits to be earned from this basket = **18**

Any course from another ‘eligible’curriculum

Any unused Discipline Elective from his/ her ‘own’ curriculum

Any stand-alone course declared as “Open Elective” by School/ Dept. for a specific ‘eligible’ degree program

Any School approved NPTEL/ Swayam courses for a maximum of 6-credits