

B. Tech (EEE) –CURRICULUM (KITSW-URR24-R25)
SEMESTER-WISE CURRICULUM WITH SCHEME OF INSTRUCTIONS

Abbreviations

L	Lecture Hour	E	Total Engagement in Hours
T	Tutorial Hour	C	Credit Assigned
P	Practical Hour		

I SEMESTER

Stream – I

Sl. No.	Category	Course Code	Course Title	Lectures / week					Credits
				L	T	P	O	E	C
-	IKSC	U24IK100	AICTE Mandated Student Induction Programme (Universal Human Values - I)						-
1	BSC	U24MH101	Differential Calculus and Ordinary Differential Equations	2	1	-	6	9	3
2	BSC	U24PY102D	Engineering Physics (for EEE)	2	1	2	5	10	4
3	PCC	U24EE103	Electrical Measurements & Sensors	2	1	-	4	7	3
4	ESC	U24EE104	Programming for Problem Solving with C	2	1	2	5	10	4
5	ESC	U24EE105D	Basic Electrical Engineering (for EEE)	2	1	2	5	10	4
6	VAC	U24CY106	Environmental Studies	2	-	-	3	5	-
7	AEC	U24AE107	IDEA Lab Makerspace	-	-	2	2	4	1
8	ELC	U24EL108	Practicum-1	-	-	-	4	4	1
9	VAC	U24VA109	SEA - I / SAA-1	-	-	-	2	2	1
10	AEC	U24AE110	Expert Talk Series-1	-	-	-	1	1	1
Total:				12	5	8	37	62	22
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean, AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)									

Pool - I (Physics)		
S.No.	Course Code	Course Title
1.	U24PY102A	Engineering Physics (<i>for Civil Engineering</i>)
2.	U24PY102B	Engineering Physics (<i>for ECIE</i>)
3.	U24PY102C	Engineering Physics (<i>for CSE</i>)
4.	U24PY102D	Engineering Physics (<i>for EEE</i>)
5.	U24PY102E	Engineering Physics (<i>for ECE</i>)

Pool - II (Basic Electrical & Electronics Engineering)		
S.No.	Course Code	Course Title
1.	U24EE105A	Basic Electrical and Electronics Engineering (<i>for Civil Engineering</i>)
2.	U24EE105B	Basic Electrical Engineering (<i>Common to ECE and ECI</i>)
3.	U24EE105C	Basic Electrical Engineering (<i>for CSE</i>)
4.	U24EE105D	Basic Electrical Engineering (<i>for EEE</i>)

II SEMESTER

Stream-I

Sl. No.	Category	Course Code	Course Title	Lectures / week			Credits
				L	T	P	C
1	BSC	U24MH201	Matrix Theory and Vector Calculus	2	1	-	3
2	BSC	U24CY202D	Engineering Chemistry (for EEE)	2	1	-	3
3	PCC	U24EE203	Analog Electronics	2	1	-	3
4	ESC	U24EE204	Data Structures through C	2	1	-	3
5	HSMC	U24MH205	English Communication and Report Writing	2	-	-	2
6	VAC	U24VA206	Sports & Yoga	-	-	2	1
7	ESC	U24ME207	Engineering Graphics Through CAD	-	-	2	1
8	SEC	U24EE208	Programming Skill Development (PSD) Lab-1	-	-	2	1
9	ELC	U24CY209D	Engineering Chemistry Lab (for EEE)	-	-	2	1
10	ESC	U24EE210	Data Structures through C Lab	-	-	2	1
Total:				10	4	10	19

Pool - III (Chemistry)		
S. No.	Course Code	Course Title
1.	U24CY202A	Engineering Chemistry <i>(for Civil Engineering)</i>
2.	U24CY202B	Engineering Chemistry <i>(for ECIE)</i>
3.	U24CY202C	Engineering Chemistry <i>(for CSE)</i>
4.	U24CY202D	Engineering Chemistry <i>(for EEE)</i>
5.	U24CY202E	Engineering Chemistry <i>(for ECE)</i>

Bridge Courses for exit:

Successful completion of two projects (6-Credits) during a 2-months internship at the institute

(OR)

Successful completion of two suitable skill-based courses (external) to qualify for Certification

A. After First Year: (UG Certificate in EEE)

(i) The candidate should pass any two of the following additional courses (ITI Level) during the 2-Months internship at the institute

Exit Option to Qualify UG Certificate in EEE: Any Two (02) Courses during the 2 - Months internship									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	PCC	U24EE211X	Electrical Wiring	2	-	2	-	4	3
2	PCC	U24EE212X	Fundamentals of Electrical Wire joints and Soldering	2	-	2	-	4	3
3	PCC	U24EE213X	Lighting installation	2	-	2	-	4	3
4	PCC	U24EE214X	Any other course approved by BoS Chair and Dean AA	2	-	2	-	4	3

(OR)

(ii) Any two suitable skill-based courses to qualify for Certification.

Exit Option to Qualify UG Certificate in EEE: Any Two (02) Skill-based Courses -:									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	SEC	U24SE211X	Electrical Household Wiring	-	-	6	-	6	3
2	SEC	U24SE212X	Electrical Earthing Installation	-	-	6	-	6	3
3	SEC	U24SE213X	Electrical illumination and testing	-	-	6	-	6	3
4	SEC	U24SE214X	Any other skill-based course approved by BoS Chair and Dean AA	-	-	6	-	6	3

III SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	BSC	U24MH301G	Applied Mathematics	2	1	-	3	3
2	PCC	U24EE302	Network Analysis	2	1	-	3	3
3	PCC	U24EE303	Digital Electronics and Operational Amplifier	2	1	-	3	3
4	PCC	U24EE304	DC Machines & Transformers	2	1	-	3	3
5	PCC	U24EE305	OOP through Java	2	1	-	3	3
6	PCC	U24EE306	Electromagnetic Fields	2	1	-	3	3
7	PCC	U24EE307	Networks and Simulation Laboratory	-	-	2	2	1
8	PCC	U24EE308	DC Machines & Transformers Laboratory	-	-	2	2	1
9	ESC	U24EE309	OOP through Java Laboratory	-	-	2	2	1
Total				12	6	6	24	21
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				"Programming in C" bridge course for Non-CS/IT Lateral Entry students				

IV SEMESTER

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	PCC	U24EE401	Control Systems Engineering	2	1	-	3	3
2	PCC	U24EE402	AC Machines	2	1	-	3	3
3	PCC	U24EE403-R25	Signals and Systems	2	1	-	3	3
4	PCC	U24EE404	Power System Generation & Distributions	2	1	-	3	3
5	ESC	U24EE405	Python Programming	2	1	-	3	3
6	VAC	U24VA406B	Soft & Interpersonal Skills	-	-	2	2	1
7	PCC	U24EE408	Control Systems Engineering Laboratory	-	-	2	2	1
8	PCC	U24EE409	Electrical Machines Laboratory	-	-	2	2	1
9	ESC	U24EE410	Python Programming Laboratory	-	-	2	2	1
Total				10	5	8	23	19
10	VAC*	U24CY411*	Environmental Science (For lateral entry students only)	2	-	-	2	1
Total (For lateral entry students only)				12	5	8	25	20
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL				

Bridge Courses for exit:

Successful completion of two projects (6-Credits) during a 2-months internship at the institute

(OR)

Successful completion of two suitable skill-based courses (external) to qualify for Certification

B. After Second Year: (UG Diploma in EEE)

(i) The candidate should pass any two of the following additional courses (Diploma Level) during the 2-Months internship at the institute

Exit Option to Qualify UG Diploma in EEE: Any Two (02) Courses during the 2 - Months internship									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	PCC	U24EE411X	Working, Servicing, and Repair of Electrical Appliances	2	-	2	-	4	3
2	PCC	U24EE412X	Electrical Design, Drawing and Estimation	2	-	2	-	4	3
3	PCC	U24EE413X	Testing and maintenance of DC machines	2	-	2	-	4	3
4	PCC	U24EE414X	Any other course approved by BoS Chair and Dean AA	2	-	2	-	4	3

(OR)

(ii) Any two suitable skill-based courses to qualify for Diploma.

Exit Option to Qualify UG Diploma in EEE: Any Two (02) Skill based Courses -:									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	SEC	U24SE411X	Electrical Estimation and Energy Auditing	-	-	6	-	6	3
2	SEC	U24SE412X	Programmable Logic Controller	-	-	6	-	6	3
3	SEC	U24SE413X	Electrical CAD (Computer-Aided Design)	-	-	6	-	6	3
4	SEC	U24SE414X	Any other skill-based course approved by BoS Chair and Dean AA	-	-	6	-	6	3

B. Tech Honours with Research:

Students opting for B. Tech Honours with Research shall undergo a 2-Month Mandatory Research Internship-I (5 Credits) at their respective department during the summer vacation after IV Semester.

V SEMESTER (STREAM -I)

Sl. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	OEC	U24OE501X-SE	Open Elective -SEB (Pool - XV)	2	1	-	3	3
2	PCC	U24EE502	Power Electronics	2	1	-	3	3
3	PCC	U24EE503	Power System - II	2	1	-	3	3
4	PCC	U24EE504	Microprocessors & Microcontrollers	2	1	-	3	3
5	PCC	U24EE505	Utilization of Electric Energy	2	1	-	3	3
6	IKSC	U24IK506A	Universal Human Values - II	2	-	-	2	2
7	HSMC	U24MH507	Technical English	-	-	2	2	1
8	PCC	U24EE508	Power Electronics Laboratory	-	-	2	2	1
9	PCC	U24EE509	Microprocessors & Microcontrollers Laboratory	-	-	2	2	1
10	ELC	U24EE510	Seminar	-	-	2	2	1
Total:				12	5	8	25	21
Additional Learning [@] : Maximum credits allowed for Honours/Minor				-	-	-	-	5
Total credits for Honours/Minor students:				-	-	-	-	26
Summer/ Inter-sem Bridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL				

Pool -XV Startups & Entrepreneurship Basket (OE - S&EB)		
S. No.	Course Code	Course Title
1.	U24OE501A-SEB	Design Thinking
2.	U24OE501B-SEB	Innovative Product Design and Development
3.	U24OE501C-SEB	Entrepreneurship
4.	U24OE501D-SEB	Design Studio
5.	U24OE501Z-SEB	Any other course approved by BoS Chair and Dean AA

VI SEMESTER (STREAM-I)

Sl. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	OEC	U24OE601X-MB	Open Elective – MB (from Pool -XVII)	2	1	-	3	3
2	PEC	U24EE602	Program Elective –I / MOOCs-I	2	1	-	3	3
3	PCC	U24EE603	Power Semiconductor Drives	2	1	-	3	3
4	PCC	U24EE604	Renewable Energy Systems	2	1	-	3	3
5	PCC	U24EE605	Artificial Intelligence & Machine Learning	2	1	-	3	3
6	IKSC	U24IK606B	Essence of Indian Traditional Knowledge	2	-	-	2	2
7	PCC	U24EE607	Power Semiconductor Drives Laboratory	-	-	2	2	1
8	PCC	U24EE608	Renewable Energy Systems Laboratory	-	-	2	2	1
9	PCC	U24EE609	Artificial Intelligence & Machine Learning Laboratory	-	-	2	2	1
10	ELC	U24EE610	Mini Project	-	-	2	2	1
Total:				12	5	8	25	21
Additional Learning@:Maximum credits allowed for Honours/Minor				-	-	-	-	5
Total credits for Honours/Minor students:				-	-	-	-	26
Summer/ Inter-semBridge Courses (Approved by BoS and Dean,AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet)				NIL				

Pool -XVII Management Courses Basket (OE-MB)		
S. No.	Course Code	Course Title
1.	U24OE601A-MB	Management Economics and Accountancy
2.	U24OE601B-MB	Engineering Finance
3.	U24OE601C-MB	Organisational Behaviour
4.	U24OE601D-MB	E-Commerce and Digital Marketing
5.	U24OE601Z-MB	Any other course approved by BoS Chair and Dean AA

Bridge Courses for exit:

Successful completion of two projects (6-Credits) during a 2-months internship at the institute
(OR)

Successful completion of two suitable skill-based courses (external) to qualify for Certification

C. After Third Year:(B. Voc. in EEE)

(i) The candidate should pass any two of the following additional courses (Degree Level) during the 2-Months internship at the institute

Exit Option to Qualify B. Voc in EEE: Any Two (02) Courses during the 2 - Months internship									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	PCC	U24EE611X	Testing and maintenance of AC machines	2	-	2	-	4	3
2	PCC	U24EE612X	Testing and maintenance of batteries and solar cell	2	-	2	-	4	3
3	PCC	U24EE613X	Introduction to Control of Electric Vehicle	2	-	2	-	4	3
4	PCC	U24EE614X	Any other course approved by BoS Chair and Dean AA	2	-	2	-	4	3

(OR)

(ii) Any two suitable skill-based courses to qualify for B. Voc in EEE Degree.

Exit Option to Qualify B. Voc in EEE: Any Two (02) Skill based Courses:									
S. No.	Category	Course Code	Course Title	L	T	P	O	E	C
1	SEC	U24SE611X	Introduction to Hybrid Electric Vehicle using MATLAB and Simulink	-	-	6	-	6	3
2	SEC	U24SE612X	Installation of Solar PV panel	-	-	6	-	6	3
3	SEC	U24SE613X	Fault Detection and troubleshooting of inverter, stabilizer, UPS & battery charger	-	-	6	-	6	3
4	SEC	U24SE614X	Any other skill based course approved by BoS Chair and Dean AA	-	-	6	-	6	3

(Note to HoDs on PCC: Under PCC the departments shall plan appropriate courses upto 6th semester covering GATE syllabus).

VII SEMESTER (STREAM -I)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	OEC	U24OE701X -SDG	Open Elective -SDG	2	1	-	3	3
2	PEC	U24EE702	Program Elective - II/ MOOCs-II	2	1	-	3	3
3	PCC	U24EE703	Power System Operation and Control	2	1		3	3
4	PCC	U24EE704	Switchgear and Protection	2	1	-	3	3
5	PCC	U24EE705	Electric Vehicles	2	1	-	3	3
6	PCC	U24EE706	Power System Laboratory	-	-	2	2	1
7	PCC	U24EE707	Electrical Simulation Laboratory	-	-	2	2	1
8	ELC	U24EE708	Internship Evaluation	-	-	2	2	1
9	ELC	U24EE709	Major Project Phase-1 / Industrial Internship -1	-	-	8	8	4
Total:				10	5	14	29	22
Additional Learning [®] :Maximum credits allowed for Honours/Minor				-	-	-	-	4
Total credits for Honours/Minor students:				-	-	-	-	26

Pool - XIX		
Sustainable Development Goals Basket (OE - SDGB)		
S. No.	Course Code	Course Title
1.	U24OE701A-SDG	<i>Sustainable waste management and circular economy</i> -offered by CE
2.	U24OE701B-SDG	<i>Sustainable Heat and Energy Engineering</i> - offered by ME
3.	U24OE701C-SDG	<i>Sensors And Actuators for Sustainable Smart Cities And Health Care</i> -offered by ECI
5.	U24OE701Z-SD	Any other course approved by BoS Chair and Dean AA

VIII SEMESTER (STREAM -I)

S. No.	Category	Course Code	Course Title	Lectures / week				Credits
				L	T	P	E	C
1	PEC	U24EE801	Program Elective - III / MOOCs-III	2	1	-	3	3
2	PEC	U24EE802	Program Elective - IV / MOOCs-IV	2	1	-	3	3
3	PCC	U24EE803	Smart Electric Grid	2	1	-	3	3
4	ELC	U24EE804	Major Project Phase - 2 / Industrial Internship - 2	-	-	12	12	6
Total:				6	3	12	21	15
Additional Learning [@] :Maximum credits allowed for Honours/Minor				-	-	-	-	4
Total credits for Honours/Minor students:				-	-	-	-	19

@ List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

B. Tech Honours with Research

Students opting for B. Tech Honours with Research, shall Publish a research paper in reputed journal indexed by SCI/SCOPUS/Web of Science (4 Credits).

SUMMARY

SEMESTER	I	II	III	IV	V	VI	VII	VIII	TOTAL
CREDITS FOR STREAM-I	22	19	21	19	21	21	22	15	160

PROGRAM ELECTIVE COURSES (PEC)

*There are four slots allotted to Program Elective Courses (PECs).
Each major specialization of the B. Tech Programme is treated as a vertical.*

VERTICAL/PE	PE1	PE2	PE3	PE4
VERTICAL 1: Power Systems	U24EE602A: High Voltage Engineering	U24EE702A: Microgrids & Distributed Generation	U24EE801A: FACTS	U24EE802A: Power System Derugulation
	(OR)			
	<i>Equivalent MOOC approved by BoS Chair and Dean AA</i>			
VERTICAL 2: Electrical Machines & Power Electronics	U24EE602B: Special Electrical Machines	U24EE702B: Modern Power Electronics	U24EE801B: HVDC Transmission	U24EE802B: Modeling and Simulation of Electrical Machines
	(OR)			
	<i>Equivalent MOOC approved by BoS Chair and Dean AA</i>			
VERTICAL 3: Controls & Automation	U24EE602C: Modern Control Theory	U24EE702C: Distribution System Planning and Automation	U24EE801C: Digital Control Systems	U24EE802C: Industrial Automation and Control
	(OR)			
	<i>Equivalent MOOC approved by BoS Chair and Dean AA</i>			

SUMMARY OF CURRICULUM COMPONENTS

S.No.	CATEGORY	COURSE COMPONENT	TOTAL COURSES	TOTAL CREDITS	CURRICULUM CONTENT (%OF CREDITS)
1	HSMC	Humanity, Social Sciences and Management Courses	02	03	1.87
2	BSC	Basic Science Courses	05	16	10.00
3	ESC	Engineering Science Courses	07	17	10.62
4	PCC	Program Core Courses	34	78	48.75
5	PEC	Program Elective Courses	04	12	7.50
6	OEC	Open Elective Courses	03	09	5.63
7	ELC	Experiential Learning Courses	07	15	9.38
8	IKSC	Indian Knowledge System Courses	02	04	2.5
9	VAC	Value Added Courses	04	03	1.88
10	SEC	Skill Enhancement Courses	01	01	0.62
11	AEC	Ability Enhancement Courses	02	02	1.25
Total			71	160	100

The curriculum supports approximately 60% of Theory and 40 % of Lab including PW. Online courses are optional

SEMESTER WISE COURSE / CREDIT DISTRIBUTION

Semester	Number of Courses / Number of Credits (<i>Course Category wise</i>)											TOTAL
	BSC	ESC	HSMC	PCC	OEC	PEC	SEC	VAC	ELC	AEC	IKSC	
I	2/7	2/8		1/3				2/1	1/1	2/2		10/22
II	2/6	3/5	1/2	1/3			1/1	1/1	1/1			10/19
III	1/3			8/18								9/21
IV		2/4		6/14				1/1				9/19
V			1/1	6/14	1/3				1/1		1/2	10/21
VI				6/12	1/3	1/3			1/1		1/2	10/21
VII				5/11	1/3	1/3			2/5			9/22
VIII				1/3		2/6			1/6			4/15
Total												71/160
% Weightage of Course Category	10.00% (16/160)	10.62% (17/160)	1.87 % (3/160)	48.75 % (78/160)	5.63% (9/160)	7.50 % (12/160)	0.62 % (1/160)	1.88 % (3/160)	9.38% (15/160)	1.25 % (2/160)	2.50% (4/160)	100 % (71/160)

* Seminar-1 C , Mini Project- 1 C, Internship Evalution-1 C, Major Project : 4+6