

Mohgaon, Wardha Road, Nagpur - 441 108 An Autonomous Institute



## DEPARTMENT OF ELECTRICAL ENGINEERING

# **B.Tech. Electrical Engineering**

## **VIII Semester**

# **Syllabus**

From

Academic Year 2024-25

### Tulsiramji Gaikwad-Patil College of Engineering & Technology, Nagpur

(An Autonomous Institution Affiliated to RTM Nagpur University, Nagpur)

#### SCHEME OF INSTRUCTION & SYLLABI

#### **Programme: Electrical Engineering**

#### Scheme of Instructions: Final Year B.Tech. in Electrical Engineering

#### Semester – VIII

Sr.	Course	e y Course Code	Course Title	L	т	D	Contact Hrs/Wk	Credits	Exam Scheme				
No.	Category				L	ſ			CT-1	<b>CT-2</b>	TA/CA	ESE	TOTAL
1.	PROJ	BEE4801	Industry Based Project/Industry Interaction	-	-	18	18	9	-	-	75	75	150
2.	PCC	BEE4802	Professional Efficiency	-	-	2	4	2	-	-	-	100	100
3.	HSMC	BEE4803	Extra-Curricular Activities/Co- Curricular Activities/Competitive Exams	-	-	4	4	2	-	-	100		100
4.	MCC	BAU4808	Project based Science, Technology, Social Design and Innovation	n 2	-	-	2	Audit	-	-	-	-	-
			Total	2	2	24	28	13	-	-	175	175	350

L- Lecture CT1- Class Test 1 CT2- Class Test 2 T-Tutorial P-Practical TA/CA- Teacher Assessment/Continuous Assessment ESE- End Semester Examination (For Laboratory End Semester Performance)

Course Category	HSMC (Hum.Soc.Sc.Mg mt)	BSC (Basic Sc)	ESC (Engg. Sc)	PCC ogramme Core Course)	PEC(Progr amme Elective Course)	OEC (Open Elective Course from other diciplines)	Project/Seminar/ Industrial Training	MCC (Mandatory Course)
Credits	04			02			07	Yes
Cumulative Sum	13	25	21	57	18	18	11	

#### PROGRESSIVE TOTAL CREDITS: 150+13=163

Tutsiramji Galowad Patil College of Engineering & Technology, Nagpur

Dean Academics Dean Academics Tuisiramji Gaikwad-Patii College Of Engineering and Technology, Nagsur

Principal

Principal Tuisiramji Gaikwad Patil College Of Engineering and Technology Nagpur

3	Tulsiramji Gaikwad-Patil College of Engineering and Technology           Wardha Road, Nagpur-441 108						
3			NAA An Auton	C Accredited (A+ Grade)	NBA Accredited	pur	
		Fo	ourth Year (	Semester-VIII) B.Tech	. Electrical Eng	ineering	
			E	BEE4802: Professional	Efficiency		
Tea	ching So	heme	•		Examinatio	on Scheme	
Lec	tures		0 Hrs/week		<b>CT-1</b>	-	
Pra	ctical		4 Hrs/week		<b>CT-2</b>	-	
Tot	al Credi	t	2		СА	-	
			·		ESE	100 Marks	s
					Total	100 Marks	s
					Duration of	ESE: 03 Hrs 00 ]	Min.
Cou	ırse Obj	ective	:				
1	To enh	ance j	participants' te	chnical proficiency and ens	ure they are up-to-c	late with the lates	st tools,
2	techno	logies	, and methodo	logies in their professional	fields.		
2	enhanc	vide p e proc	ductivity.	n skills for efficient project	management and w	orknow optimiza	ation to
<b>3</b> To improve participants' ability to communicate complex technical information clearly and foster effective team collaboration							foster
				<b>Course Contents</b>			Hours
		Elec	tric Circuits				
<ul> <li>Vnit I</li> <li>Network elements, KCL, KVL.</li> <li>Circuit analysis techniques (nodal, mesh, superposition, Thevenin, Norton).</li> <li>Transient and steady state analysis of RLC circuits, Resonance.</li> <li>Two port networks.</li> <li>Electromagnetic Fields</li> <li>Coulomb's Law, Gauss's Law, Electric and magnetic fields.</li> <li>Maxwell's Equations, Transmission lines.</li> </ul>				(4)			
U	• Waveguides, Antennas.         • Waveguides, Antennas.         Signals and Systems         • Continuous and discrete time signals, Fourier series, Fourier transforms.         • Laplace transforms, Z transforms.         • Convolution, LTI systems.         Electrical Machines         • Single phase transformers, Three phase transformers.         • DC mechanes         • DC mechanes					(4)	
U	Unit III       Power Systems         • Power generation concepts, Transmission and distribution.         • Load flow analysis, Fault analysis, Protection.         • Control Systems         • Feedback principles, Transfer function.         • State space analysis, PID controllers, Frequency response analysis.						(4)
U	nit IV	Elec Ana	<ul> <li>Measureme capacitance</li> <li>Bridges, Inc</li> <li><b>log and Digita</b></li> <li>Diodes, BJ'</li> </ul>	ectronic Measurements ent of voltage, current, powe strumentation amplifiers, Tr al Electronics Ts, MOSFETs	ver, energy, resistar ransducers	ace, inductance,	(4)

	Amplifiers, Op amps, Digital logic circuits.					
	Power Electronics					
	<ul> <li>Semiconductor power diodes and transistors.</li> </ul>					
	• AC to DC converters, DC to DC converters.					
Un	<b>nit V</b> • Inverters, Thyristors.	(4)				
	Electrical Engineering Materials					
	Conductors, semiconductors, insulators.					
	Superconductivity, Magnetic materials.					
Text ]	Books					
1	Electrical Machinery by P.S Bimbhra: 2020.					
2	Control Systems Engineering, by I.J. Nagrath and M. Gopal, 2021.					
3	Power Electronics by P.S Bimbhra: 2022.					
Refer	rence Books					
1	Signals and Systems 2nd Edition by Alan V. Oppenheim, Allan S. Willsky, S. Hamid Nawa	ab:				
1	2015.					
2	Circuit Theory: Analysis and Synthesis (English) 6th Edition by A Chakraborty: 2021.					
3	A Course in Electrical and Electronic Measurements and Instrumentation by A. K. Sawhney 2021.	y:				

	Course Outcomes	CL
BEE4802.1	<b>Choose</b> network theorems for analysis and design of A.C. & DC circuits and Analyze Magnetic Circuit using Coulomb's law, Gauss's law and Divergence theorem.	3
BEE4802.2	<b>Identify</b> the types of systems in given conditions and explain the principle and working of Electric Machines.	3
BEE4802.3	<b>Illustrate</b> the Feedback in control system with block diagram representation of closed loop control system.	4
BEE4802.4	<b>Justify</b> the use of different electrical instruments for electrical measurement system. Elaborate the working principle of combinational circuits.	4
BEE4802.5	Understand the operation of power electronic devices and its applications.	2

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Tulsiramji Gaikwad-Patil College of Engineering and Technology Wardha Road, Nagpur-441 108 NAAC Accredited (A+ Grade) & NBA Accredited An Autonomous Institute affiliated to RTMNU Nagpur Fourth Year (Semester-VIII) B.Tech. Electrical Engineering



### BAU4808: Project based Science, Technology, Social, Design and Innovation

<b>Teaching Schem</b>	e	<b>Examination So</b>	cheme
Lectures	2 Hrs/week	<b>CT-1</b>	-
Tutorial	- Hrs/week	<b>CT-2</b>	-
Total Credit	Audit	СА	-
		ESE	-
		Total	-
		<b>Duration of ESE</b>	:

### **Course Objective:**

1	To de	develop participants' ability to apply interdisciplinary methods combining science, technology,					
	social	sciences, design, and innovation to solve complex real-world problems.					
2	To eq	up participants with skills for effective project-based learning, including planning,					
2	To on	tion, and iterative design processes to roster innovation.	olutions				
3	addree	ssing societal challenges ethically and environmentally	solutions				
	addre	Course Contents	Hours				
		Foundations of Science and Technology					
U	nit I	• Basics of scientific inquiry and method.	(2)				
		• Introduction to key technological concepts and tools.					
		Introduction to Interdisciplinary Thinking					
		• Definition of interdisciplinary thinking and its significance in solving					
I.I.	.:+ TT	complex problems.	( <b>2</b> )				
Un	111 11	• Exploration of diverse fields such as natural sciences, social sciences,	(2)				
		humanities, and engineering.					
		• Case studies highlighting successful interdisciplinary projects.					
		Social Perspectives and Ethics					
		• Societal impacts of science and technology.					
Un	it III	• Ethical considerations in innovation and design.	(2)				
		• Discussions on diversity, equity, and inclusion in STEM. (Science,					
		technology, engineering, and mathematics)					
		Design Thinking and Innovation					
Um	<b>:4 TX</b> 7	• Principles of design thinking.	( <b>2</b> )				
UI	11 1 V	• Prototyping and iteration techniques.	(2)				
		• Design challenges and exercises.					
		Project Development and Implementation					
		• Identifying and scoping real-world problems.					
		• Iterative project development with milestones.					
Un	nit V	Project Presentation and Reflection	(2)				
		• Final project presentations.					
		Reflection on learning outcomes and future applications.					

Text I	Books
1	Design Thinking for Innovation: Research and Practice: by Walter Brenner (Editor), Falk Uebernickel (Editor) (2016)
2	Introduction to Interdisciplinary Studies: 3rd Edition (2019)
	Allen F. Repko - University of Texas at Arlington (Retired)
	Rick Szostak - University of Alberta, Canada
	Michelle Phillips Buchberger - Miami University of Ohio, USA
3	Professional Ethics & Human Values by Dr. M. R. Suchitra and Dr. S. Parthasarathy. 2020

Refer	ence Books
1	Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation (Hardcover)
	by Tim Brown. 2009
2	Investigating Interdisciplinary Collaboration: Theory and Practice across Disciplines, Frickel, Scott
	Rutgers University Press, 2016

	Course Outcomes	CL
BAU4808.1	<b>Integrate</b> scientific principles and technological tools to solve complex problems.	3
BAU4808.2	<b>Develop</b> design thinking skills and apply them to innovate solutions.	6
BAU4808.3	Employ ethical considerations in innovation and design.	3
BAU4808.4	Apply design Thinking Methods and Tools	3
BAU4808.5	<b>Identify</b> ethical, cultural, and societal implications of technology and innovation.	5

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