TULSIRAMJI GAIKWAD-PATIL College of Engineering & Technology

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. No.	Course Category	Course Code	Course Title	L	T	P	Contact Hrs/Wk	Credits	Exam Scheme				
									CT-1	CT-2	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		2	-	-	2	Audit	-	-	-	-	-
			Total	**2**	**2**	**24**	**28**	**13**	-	-	**175**	**175**	**350**

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

Course Category	HSMC (Hum.Soc.Sc.Mgmt)	BSC (Basic Sc)	ESC (Engg. Sc)	PCC (Programme Core Course)	PEC(Programme 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

BoS Chairman
HOD
Department of Electrical Engineering
Tulsiramji Gaikwad Patil College of Engineering & Technology, Nagpur

Dean Academics
Dean Academics
Tulsiramji Gaikwad-Patil College Of Engineering and Technology, Nagpur

Principal
Principal
Tulsiramji Gaikwad Patil College Of Engineering and Technology Nagpur

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

BEE4802: Professional Efficiency

Teaching Scheme	
Lectures	0 Hrs/week
Practical	4 Hrs/week
Total Credit	2

Examination Scheme	
CT-1	-
CT-2	-
CA	-
ESE	100 Marks
Total	100 Marks
Duration of ESE: 03 Hrs 00 Min.	

Course Objective:

1	To enhance participants' technical proficiency and ensure they are up-to-date with the latest tools, technologies, and methodologies in their professional fields.
2	To provide participants with skills for efficient project management and workflow optimization to enhance productivity.
3	To improve participants' ability to communicate complex technical information clearly and foster effective team collaboration

Course Contents		Hours
Unit I	**Electric Circuits** • Network elements, KCL, KVL. • Circuit analysis techniques (nodal, mesh, superposition, Thevenin, Norton). • Transient and steady state analysis of RLC circuits, Resonance. • Two port networks. **Electromagnetic Fields** • Coulomb's Law, Gauss's Law, Electric and magnetic fields. • Maxwell's Equations, Transmission lines. • Waveguides, Antennas.	**(4)**
Unit II	**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 machines, Synchronous machines, Induction machines.	**(4)**
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)**
Unit IV	**Electrical and Electronic Measurements** • Measurement of voltage, current, power, energy, resistance, inductance, capacitance • Bridges, Instrumentation amplifiers, Transducers **Analog and Digital Electronics** • Diodes, BJTs, MOSFETs	**(4)**

	• Amplifiers, Op amps, Digital logic circuits.	
Unit V	**Power Electronics** • Semiconductor power diodes and transistors. • AC to DC converters, DC to DC converters. • Inverters, Thyristors. **Electrical Engineering Materials** • Conductors, semiconductors, insulators. • Superconductivity, Magnetic materials.	**(4)**

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.
Reference Books	
1	Signals and Systems 2nd Edition by Alan V. Oppenheim, Allan S. Willsky, S. Hamid Nawab: 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.

	Course Outcomes	**CL**
BEE4802.1	**Choose** 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	**Identify** the types of systems in given conditions and explain the principle and working of Electric Machines.	**3**
BEE4802.3	**Illustrate** the Feedback in control system with block diagram representation of closed loop control system.	**4**
BEE4802.4	**Justify** 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**

HOD
Department Of Electrical Engineering
Tulsiramji Gaikwad - Patil College
Of Engineering And Technology
Nagpur

Dean Academics
Tulsiramji Gaikwad-Patil
College Of Engineering
and Technology, Nagpur

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

Teaching Scheme	
Lectures	2 Hrs/week
Tutorial	- Hrs/week
Total Credit	Audit

Examination Scheme	
CT-1	-
CT-2	-
CA	-
ESE	-
Total	-
Duration of ESE: -.	

Course Objective:

1	To develop participants' ability to apply interdisciplinary methods combining science, technology, social sciences, design, and innovation to solve complex real-world problems.
2	To equip participants with skills for effective project-based learning, including planning, execution, and iterative design processes to foster innovation.
3	To encourage participants to design and implement socially responsible and sustainable solutions addressing societal challenges ethically and environmentally

	Course Contents	Hours
Unit I	**Foundations of Science and Technology** • Basics of scientific inquiry and method. • Introduction to key technological concepts and tools.	**(2)**
Unit II	**Introduction to Interdisciplinary Thinking** • Definition of interdisciplinary thinking and its significance in solving complex problems. • Exploration of diverse fields such as natural sciences, social sciences, humanities, and engineering. • Case studies highlighting successful interdisciplinary projects.	**(2)**
Unit III	**Social Perspectives and Ethics** • Societal impacts of science and technology. • Ethical considerations in innovation and design. • Discussions on diversity, equity, and inclusion in STEM. (Science, technology, engineering, and mathematics)	**(2)**
Unit IV	**Design Thinking and Innovation** • Principles of design thinking. • Prototyping and iteration techniques. • Design challenges and exercises.	**(2)**
Unit V	**Project Development and Implementation** • Identifying and scoping real-world problems. • Iterative project development with milestones. **Project Presentation and Reflection** • Final project presentations. • Reflection on learning outcomes and future applications.	**(2)**

Text 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

Reference 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	**Integrate** scientific principles and technological tools to solve complex problems.	3
BAU4808.2	**Develop** 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	**Identify** ethical, cultural, and societal implications of technology and innovation.	5

HOD
Department Of Electrical Engineering
Tulsiramji Gaikwad - Patil College
Of Engineering And Technology
Nagpur

Dean Academics
Tulsiramji Gaikwad-Patil
College Of Engineering
and Technology, Nagpur

Vice-Principal
TulsiRamji Gaikwad Patil
College Of Engineering &
Technology, Nagpur

Principal
Tulsiramji Gaikwad Patil College Of
Engineering and Technology, Nagpur