GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Master of Technology					Branch/Spec.	Electronics and Communication Engineering – Embedded Systems		
Semester	I					Version	1.0.0.0		
Effective from Academic Year			2026-27			Effective for the Batch admitted in			July 2026
Course Code	3ES1106		Course Name			Embedded Laboratory-I			
Teaching Scheme						Examination Scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	-	-	1	-	1	Theory	-	-	-
Hours	-	-	2	-	2	Practical	25	25	50

Pre-requisites

Fundamental knowledge of Embedded C Programming, Microcontrollers and Microprocessors , Digital Electronics, Basic Electronics and Sensors

Course Outcomes

On successful completion of the course, the students will be able to:

CO1	Develop and debug Embedded C programs on microcontroller platforms.
CO2	Interface sensors, actuators, and communication peripherals with embedded hardware.
CO3	Design and implement real-time embedded applications using timers, interrupts, and communication protocols.
CO4	Prepare technical reports and demonstrate embedded system prototypes.

Theory Syllabus

Unit	Content	Hrs.
1	A student is required to perform laboratory experiments and develop embedded system applications related to the subjects studied during the semester such as Embedded C Programming, Microcontroller Architecture, Digital System Design, Sensor Interfacing, Communication Protocols, and Real-Time Embedded Systems. The laboratory work shall focus on hardware-software co-design through the implementation of practical applications using microcontroller development boards, sensors, actuators, and peripheral interfaces. Students shall perform experiments involving GPIO programming, timers, interrupts, ADC/DAC interfacing, UART, SPI, I2C communication, and basic real-time applications. The student shall deliver periodic demonstrations and presentations during the semester to showcase the implementation methodology, system design, debugging process, and performance analysis of the developed applications. Each student shall maintain a laboratory record containing objectives, circuit diagrams, algorithms, source code, experimental results, and observations. At the end of the semester, the student shall demonstrate the developed embedded applications and defend the laboratory work before a panel of examiners as part of the final evaluation. The laboratory exercises may be performed individually or in groups	30

	of a maximum of two students, depending on the complexity of the experiment and availability of resources, as approved by the course instructor.	

Mapping of CO with PO and PSO :														
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	3	-	-	-	-	-	-	-	3	2	-
CO2	3	3	2	2	3	-	-	-	-	-	-	-	3	3	-
CO3	3	3	3	2	3	-	-	-	-	-	1	-	3	3	-
CO4	2	3	2	3	2	-	-	-	-	-	2	1	2	3	-