GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology					Branch/Spec.	Computer Science & Engineering (CBA/CS/BDA/CSE)		
Semester	V					Version	1.0.0.0		
Effective from Academic Year			2024-25			Effective for the batch Admitted in			June 2022
Subject code	2CSE508		Subject Name			Microcontroller & Applications			
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

Knowledge of Digital Electronics & Computer Organization subjects.

Learning Outcome:

- Understand Architecture of Microprocessor and Microcontroller.
- Learn programming instructions and addressing modes.
- Develop application programs using assembly and C Languages.
- Design a hardware interfacing circuit comprising microcontrollers and supporting ICs to construct a useful real time application working as an electronic embedded system.

Theory syllabus

Unit	Content	Hrs
1	**Fundamentals of Microprocessor:** Compare microprocessor and microcontroller, Architecture of 8085 microprocessor, Pin details and functional operation of 8085, Memory and I/O interfacing, Basics of Programming.	08
2	**Introduction to 8051 Architecture :** The 8051 Architecture- Hardware- Oscillator and clock-program counter –data pointer-registers-stack and stack pointer-special function registers- memory organization-program memory-data memory -Input / Output Ports –External memory counter and timer-serial data Input / output-Interrupts.	10
3	**8051 Programming in Assembly Language :** Basics of 8051 Assembly Language Programming-Structure of Assembly language-Assembling and running an 8051 program- Moving Data, Different Addressing modes-Accessing memory using various addressing modes- Arithmetic operations and Programs-Logical operations and Programs -Branching - I/O Port Programs – bit level instructions and Programs –Timer and counters - and application Programs, Interrupt programming, 8051 programming in 'C'.	15
4	**Peripheral Interfacing:** Memory Interfacing, 7-Segment LED Display, LCD and Keyboard Interfacing, ADC, DAC interfacing, relay, Stepper Motor Interfacing, DC motor control, different Sensors and relevant application programs.	12

Self Study Topics :

Microcomputer Systems, RAM / ROM, Difference between Microcontroller and Microprocessor, different Buses, De-multiplexing of address/data bus, generation of control signals.
Practical content
• The practical based on syllabus contents should be properly designed • Implement an attempt to develop different types of practical skills so that students are able to acquire the competencies. • Practical list may be revised by the concerned faculty looking at the student development for meeting the current demand of industries.
Suggested List of Practicals :
Microcontroller Programming using softwares, circuit design and simulation, programs based on various Addressing modes of 8051, creating hex file, loading into software as well as real hardware, programs based on various instruction sets, timers, counters. Various interfacing circuits and verification on software as well as hardware.
Mooc Course :
https://nptel.ac.in/courses/108105102

Text Books :	
1	Microprocessor Architecture: Programming and Applications with the 8085, Penram International Publishing by R. S. Gaonkar.
2	The 8051 Microcontrollers Architecture, Programming & Applications by Kenneth J. Ayala.
3	The 8051 Microcontrollers and Embedded Systems by Muhammed Ali Mazidi.
Reference Books :	
1	Embedded Systems, Shibu K, Tata McGraw Hill Publishing, New Delhi.
2	Programming and Customizing the 8051 Microcontroller, Myke Predko, Tata McGraw-Hill Edition.

Course Outcomes:	
COs	Description
CO1	Understand Architecture of Microprocessor and Microcontroller.
CO2	Learn programming instructions and addressing modes.
CO3	Develop application programs using assembly and C Languages.
CO4	Design a hardware interfacing circuit comprising microcontrollers and supporting ICs to construct a useful real time application working as an electronic embedded system.

Mapping of CO and PO:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**3**	**1**	**3**	**2**	**2**	**3**	**3**	**2**	**1**	**2**	**3**	**3**
CO2	**2**	**2**	**2**	**1**	**3**	**1**	**1**	**1**	**2**	**3**	**1**	**1**
CO3	**1**	**3**	**2**	**3**	**1**	**1**	**3**	**3**	**1**	**1**	**2**	**2**
CO4	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**1**	**2**	**3**	**2**