AC –11-03-25
Item No. – 04

Approved by the BoS in Information Technology on 11-03-2025 Item No. 04

As Per NEP 2020

Tolani College of Commerce (Autonomous)

Title of the Course: <u>Microprocessor and Microcontroller</u>

Programme: B.Sc. (Information Technology)
Semester III

Syllabus for 4 credits
From the academic year- 2025-2026

Sr. No.	Heading	Particulars
1	**Description of the course :**	Microprocessors and microcontrollers are both integrated circuits that are used in electronic devices, but they differ in their structure, function and application.
2	**Vertical :**	Minor
3	**Type :**	Theory and Practical
4	**Credit**:	4 credits
5	**Hours Allotted :**	60 Hours
6	**Marks Allotted**:	100 Marks Continuous Evaluation: 40 Semester-End: 60
7	**Course Objectives**: 1. To understand 8085 Microprocessor Architecture, pin diagram and pin functions of IC 8085 2. To increase Students' proficiency in assembly language. 3. To get practical experience in programming. 4. To control computer system components through hardware and software interrupts.	
8	**Course Outcomes**: 1. Learners should be able to understand the fundamental difference between microprocessor and CPU 2. Learners should be able to differentiate between high level language and machine language program. 3. Learners should be able to develop the knowledge of writing the code in machine language. 4. Learners should be able to develop various interrupts using machine coding.	

9	**Module 1: Microprocessor, microcomputers, and Assembly Language, Microprocessor Architecture and Microcomputer System: (15 hours)**
	• Microprocessor, Microprocessor Instruction Set and Computer Languages, From Large Computers to Single-Chip Microcontrollers, Applications. • Microprocessor Architecture and its operation's, Memory, I/O devices, Microcomputer System, Logic Devices and Interfacing,Microprocessor-Based System Application.
	• **Module 2: Introduction to 8085 Assembly Language Programming, Introduction to 8085 Instructions: (15 hours)**
	• The 8085 Programming Model, Instruction Classification, Instruction, Data and Storage, Writing assembling and Execution of a simple program, Overview of 8085 Instruction Set, Writing and Assembling Program. • Data Transfer Operations, Arithmetic Operations, Logic Operation, Branch Operation, Writing Assembly Languages Programs, Debugging a Program.
	Module 3: Programming Techniques With Additional Instructions, Counters and Time Delays: (15 hours)
	• Programming Techniques: Looping, Counting and Indexing, Additional Data Transfer and 16-Bit Arithmetic Instructions, Arithmetic Instruction Related to Memory, Logic Operations: Rotate, Logics Operations: Compare, Dynamic Debugging. • Counters and Time Delays, Illustrative Program: Hexadecimal Counter, Illustrative Program: zero-to-nine (Modulo Ten) Counter, Generating Pulse Waveforms, Debugging Counter and Time-Delay Programs
	Module 4: Stacks and Sub-Routines, Code Conversion, BCD Arithmetic, and 16-Bit Data Operations, Interrupts: (15 hours)
	• Stack, Subroutine, Restart, Conditional Call, Return Instructions, Advanced Subroutine concepts. • BCD-to-Binary Conversion, Binary-to-BCD Conversion, BCD-to- Seven-Segment-LED Code Conversion, Binary-to-ASCII and ASCII- to-Binary Code Conversion, BCD Addition, BCD Subtraction, Introduction To Advanced Instructions and Applications, Multiplication, Subtraction With Carry. • The 8085 Interrupt, 8085 Vectored Interrupts, Restart as S/W Instructions, Additional I/O Concepts and processes.

13	**Reference Books:** **1)** Behrouz A. Forouzan, Data Communication and Networking, Tata McGraw Hill, 5th Edition,2013. **2)** https://www.javatpoint.com/computer-network-tutorial	
14	**Internal Continuous Assessment: 40%**	**Semester End Examination : 60%**
15	**Continuous Evaluation through:**	Practical Assessment

16 Format of Question Paper:

Scheme of Evaluation Pattern
Table 1A: Scheme of Continuous Evaluation (CE/Practical)
Scheme of Evaluation Pattern

Sub-components	Maximum Marks	Conditions for passing
1) Practical exam	30	a) A learner must be present for each of the sub- components
2) Journal and Viva	10	
Total	40	

Table 1B: Scheme of Semester End Examination (SEE)
Evaluation Question Paper Pattern for Semester End Examination
Maximum Marks: 60 **Duration: 2 Hrs.**

Note: All questions are compulsory. Each question has an internal choice.

Question Number		Nature of Questions	Maximum Marks
1)		**Attempt any 3**	
	a)		15
	b)		
	c)		
	d)		
	e)		
2)		**Attempt any 3**	
	a)		15
	b)		
	c)		
	d)		
	e)		
3)		**Attempt any 3**	
	a)		15
	b)		
	c)		
	d)		
	e)		
4)		**Attempt any 3**	
	a)		15
	b)		
	c)		
	d)		
	e)		