



**Third-Year of Bachelor of Science
Vocational Skill Course – Physics
Revised syllabus according to CBCS NEP - 2020**

COURSE TITLE: Embedded Systems - II

SEMESTER-VI

W.E.F. 2025-2026

**RECOMMENDED BY THE BOARD OF STUDIES IN PHYSICS
AND
APPROVED BY THE ACADEMIC COUNCIL
Devrukh Shikshan Prasarak Mandal's
Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal. Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India**

Academic Council Item No: 02/2025

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Physics
Name of the Class	:	Third Year
Semester	:	Six
Paper	:	VSC - V
No. of Credits	:	02
Title of the Course	:	Embedded System - II
Course Code	:	PHVS303
Name of the Vertical in adherence to NEP 2020	:	Vocational Skill Course
Eligibility for Admission	:	
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	5.5
Pattern of Marks Distribution for SEE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2025-2026
Ordinances /Regulations (if any)		

Syllabus for Third Year of Bachelor of Science in Physics
(With effect from the academic year 2025-2026)

SEMESTER – VI

Paper - Physics VSC – IV

Course Title: Embedded Systems - II

No. of Credits – 02

Type of Vertical: Vocational Skill Course

COURSE CODE: PHVS303

Course Learning Outcomes:

After completing the course, the learner will be able to...

Course Learning Outcome No.	Course Learning Outcome
CLO-01	Elaborate the basics of microprocessor and microcontroller devices, their history and present status
CLO-02	Describe the structure of 8051 microcontroller, its programming model and various available facilities
CLO-03	Use the instruction set of MCS-51 and select proper instructions
CLO-04	Use keil/SDCC and progISP for microcontroller development
CLO-05	Design circuit/programs for interfacing LEDs, switches & various other devices
CLO-06	Utilize serial I/O and timer/counter facilities
CLO-07	Implement 8051 development in C language

Syllabus for Third Year of Bachelor of Science in Physics

(With effect from the academic year 2025-2026)

SEMESTER - VI**Paper – Physics VSC - V****Course Title: Embedded Systems - II****Credits – 02****Type of Vertical: Vocational Skill Course****COURSE CODE: PHVS303****COURSE CONTENT**

Module	Practicals	Lectures
1	Concept of uP & uC, comparison, Programming model, Pin Signals, Memory organization of MCS-51. - Understand facts about uP and uC - Understand the basics of 8051 uC - Learn the pin signals and memory organization Ref -- AVD: Ch1 & Ch 2	10
	Minimum working system, Structure of ports, timers/counters, interrupts - Connect and verify a minimum working system - Learn the physical structure of ports - Learn the concepts and modes of timers and counters - Understanding the interrupt process and ISRs Ref -- AVD: Ch3	10
	Instruction set & Addressing Modes, developing assembly programs using Keil, SDCC and progISP, simple programs, delays, stack, subroutines. - Learning the instruction set and choosing correct instructions - Developing simple programs and using branching constructs - Use of Keil/SDCC and progISP Ref – keil/SDCC/ProgISP manual and webresources	10
2	Interfacing LEDs, Switches and keypad - LEDs and switches will be interfaced with the ports and various patterns will be demonstrated - LED matrix interfaced to display various patterns and characters 4X4 keypad interfacing Ref -- Webresources	06
	Interfacing Relays, LCDs, ADC/DAC - LCD 4 bit and 8 bit modes - Relay driver circuit and interfacing - Clock generation using 8051 timer and ISR - ADC / DAC interfacing Ref – AVD Ch 6 and Webresources	08
	Using Serial Port - Learning basics of UART - Implementing serial communication Ref -- AVD: Ch 5	06

	Stepper motor interfacing • Learning basics of stepper motor • Controlling stepper motor Ref -- AVD: Ch 6	04
	Implementing all interfacing experiments in C • Basics of C for embedded programming • Conversion of all programs to C and implementation Ref – YK	06
	Total	60

References:

- AVD: Microcontrollers: Theory and Applications by A. V. Deshmukh
- YK: Let Us C by Yashvant Kanetkar
- Online help wiki/video tutorials/YT channels
- Datasheets of various devices

Access to the Course

The course is available for students admitted for Bachelor of Science.

Methods of Assessment

The assessment pattern would be 60:40, 60% for Semester End Examination (SEE) and 40% for Continuous Internal Assessment (CIA). The structure of the SEE and CIA would be as recommended by the Board of Studies and approved by the Board of Examination and the Academic Council of the college.

Pattern of Evaluation

The Examination/Evaluation pattern shall be framed by the Board of Examination with its final approval from the Academic Council of the College.