

**Department of Electronics**  
**Revised Syllabus of Diploma - II Program (UG)**  
 (2021-22)

❖ **Title of Program: Embedded System design**

❖ **Syllabus Structure (UG)**

Year	Semester	Course No.	Course Code	Contact Hours	Credits (1Credit=15 H)	Total Marks	
2	III	CT III	DET 303	30	2	75	
		CL III	DE L303	60	2	75	
	IV	CT IV	DET 404	30	2	75	
		CL IV	DE L404	60	2	75	
	Annual	CP II	DEP202	30	1	50	
	Industrial and or Incubation and or Research and or Field Training				30	1	-
	<b>Total</b>				<b>240</b>	<b>10</b>	<b>350</b>

D: Diploma, E: Electronics, C: Course, T: Theory, L: Lab (Practical), P: Project

Total No. of Courses: 6 (Theory: 02, Practical: 02, Project: 01)

Theory and Practical: Semester, Project: Annual

❖ **Evaluation Structure :-**

Year	Semester	Theory (75 per Semester) (Marks = 150 per year)						Practical (75 per Semester) (Marks = 150 per year)						Project (Annual) ( I year:50, II, III =100)				Total	Total Marks	
		Course No.	Course Code	Internal (35) Assessment		DESE (40)	Total	Course No.	Course Code	Internal (35) Assessment		DESE (40)		Course No.	Course Code	Presentation+ Viva-Voice Oral	Dissertation			Total
				DISE	Attendance					Lab Work	Attendance	Exam	Lab Work Book							
I	I	CT I	D*T 101	30	5	40	75	CL I	D*L102	30	5	30	10	75	CP I	D* P101	25	25	50	
	II	CT II	D*T 202	30	5	40	75	CL II	D*L202	30	5	30	10	75						
				<b>Total</b>	<b>150</b>			<b>Total</b>				<b>150</b>		<b>Total</b>			<b>50</b>	<b>350</b>		
II	III	CT III	D*T 303	30	5	40	75	CL III	D*L303	30	5	30	10	75	CP II	D* P 202	25		25	50
	IV	CT IV	D*T 404	30	5	40	75	CL IV	D*L404	30	5	30	10	75						
				<b>Total</b>	<b>150</b>			<b>Total</b>				<b>150</b>		<b>Total</b>			<b>100</b>	<b>350</b>		
III	V	CT V	D*T 505	30	5	40	75	CL V	D*L505	30	5	30	10	75	CP III	D* P 303	50		50	100
	VI	CT VI	D*T 606	30	5	40	75	CL VI	D*L 606	30	5	30	10	75						
				<b>Total</b>	<b>150</b>			<b>Total</b>				<b>150</b>		<b>Total</b>			<b>100</b>	<b>400</b>		
<b>Total of Three Years</b>				<b>60</b>	<b>300</b>	<b>15</b>	<b>450</b>	<b>Total</b>	<b>60</b>	<b>15</b>	<b>240</b>	<b>60</b>	<b>450</b>	<b>Total</b>	<b>100</b>	<b>100</b>	<b>200</b>		<b>1100</b>	

D: Diploma, \*: Departmental Code (C: Chemistry, MI: Microbiology, CSE: Computer Science (Entire), etc)

C: Course, T: Theory, L: Lab (Practical), P: Project

Theory and Practical: Semester, Project: Annual

DISE I and II: Diploma Internal Semester Examination (online) for I and II Semester

DESE I and II: Diploma End Semester Examination for I and II Semester

Diploma Programme: Total Marks I and II Year: 150 (Theory) + 150 (Practical) +50 (Project) = 350

Total Marks III Year: 150 (Theory) + 150 (Practical) +100 (Project) = 400

**Semester III****CT-III: DET 303: Title: Principles of C Programming  
(Contact Hrs: 30 Credits: 2)****Learning Objectives:**

1. To Provide Conceptual Knowledge of C Programming
2. To familiarize Fundamentals of C Programming

**Unit I: Introduction to C Programming and its Concept (15)**

Introduction, Importance of C, Character set, Tokens, keywords, identifier, constants, basic data types, variables: declaration & assigning values. Structure of C program Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, bit wise operators, expressions and evaluation of expressions, type cast operator, implicit conversions, precedence of operators.

**Unit II: Fundamentals of C Programming (15)**

Decision making, branching and looping: if, if-else, else-if, switch statement, break, for loop, while loop and do loop.

Functions: Defining functions arguments and passing, returning values from functions.

Arrays-concepts, declaration, accessing elements, storing elements, two-dimensional and multi-dimensional arrays, Input output statement and library functions (math and string related functions).

Pointer Concepts, declaration of pointer, Types of pointers, pointer arithmetic

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Appreciate the importance of C Programming and their application
2. Illustrate C Programming

**Reference Books:**

1. The C Programming Language, Brian W. Kernighan / Dennis Ritchie, 2<sup>nd</sup> edition, Pearson, 2015.
2. Let Us C, Yashavant Kanetkar, BPB Publications, 2016
3. Computer Basics and C Programming, PHI Learning, V. Rajaraman, 2007
4. C in Depth, S.K.Srivastava/Deepali Srivastava, BPB Publications, 2009.
5. Programming Languages C with Practicals, Ananthi Sheshasaayee, Mahalaxmi publication, 2012

**CL-III: DEL303: Title: C Programming****(Contact Hrs: 60 Credits: 02)****Learning Objectives:**

1. To be familiar with syntax and structure of C-programming.
2. To learn problem solving techniques using C.
3. To understand the programming knowledge using Decision Statements (if, if-else, ifelse if ladder, switch and GOTO)
4. To understand programming with Matrix, string.

**(Minimum 4)****List of Practical's (15)**

1. To print a message "YCIS Satara" on the screen
2. To accept the values of int, float, char data types and display them.
3. Program to accept characters and display them.
4. Input two numbers and compute all arithmetic operations
5. Input radius, compute area, diameter, & circumference of the circle and display them.
6. Program for swapping the values of two variables
7. Program to calculate total marks and percentage of a student for 5 subjects where marks of each subject should be greater than minimum pass marks
8. Program to check whether given number is even or odd
9. Program to illustrate concept of else-if ladder to select color
10. Program to print words corresponding numbers below 9
11. To check whether number is +ve, -ve or zero.
12. Find out the sum of series  $1^2 + 2^2 + \dots + n^2$
13. Take an array of 10 integers and accept values into it. Sort the array in descending order
14. Program to solve multiplication of 2 matrices
15. Program to convert lowercase to uppercase and uppercase to lowercase.

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Describe syntax and structure of C-programming.
2. Know concepts in problem solving .
3. Do programming in C language .
4. Write diversified solutions using C language

**Reference Books:**

1. The C Programming Language, Brian W. Kernighan / Dennis Ritchie, 2<sup>nd</sup> edition, Pearson, 2015.
2. Let Us C, Yashavant Kanetkar, BPB Publications, 2016
3. Computer Basics and C Programming, PHI Learning, V. Rajaraman, 2007
4. C in Depth, S.K. Srivastava/Deepali Srivastava, BPB Publications, 2009.
5. Programming Languages C with Practicals, Ananthi Sheshasaayee, Mahalaxmi publication, 2012

**Semester IV****CT-IV: D ET 404: Title: MCS 51-8051 Microcontroller  
(Contact Hrs: 30 Credits: 2)****Learning Objectives:**

1. Familiarize with embedded microcontrollers.
2. To introduce architectural features of microcontrollers, capabilities of microcontroller and their utilization.

**Unit I: Introduction to MCS 51 Family (12)**

Introduction to Microcontroller, General block diagram, Classification of Microcontrollers- 4-bit, 8-bit, 16-bit, 32-bit, Scope of Embedded System and its Applications, 8051 Microcontroller: Features, Pin diagram

**Unit II: 8051 Microcontroller (18)**

Architecture, Reset and clock circuit, Memory organization , Interrupt, Timers /Counters and Serial I/O , Addressing Modes, Instruction sets and assembly language programming.

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Understand the architectural features of MCS-51 variants and select a suitable microcontroller to suit the application.
2. Explain architectural features of microcontrollers, capabilities of microcontroller and Describe their utilization.

**Reference Books:**

1. Microcontroller: Architecture, Programming & Applications, Ayala, Kenneth J., 2nd ed, Penram, 2007.
2. Microcontroller And Embedded Systems Using Assembly And C, Muhammad Ali Mazidi, Pearson, 2007.
3. Microcontroller: Internals, Instructions, Programming and Interfacing, Subrata Ghoshal, Pearson Education, 2010.
4. Microcontroller Basics, Davies J H, Elsevier, 2011.
5. Microcontroller Programming: An Introduction, Syed R. Rizvi, CRC Press, 2011.
6. Microcontroller: Architecture, Assembly Language, And Hardware Interfacing, Craig Steiner, Dreamtech, Press, 2012.

**CL-IV:DE L404: Title (Practical): Microcontroller Laboratory**  
**(Contact Hrs: 60 Credits: 02)**

**Learning Objectives:**

1. To Relate concepts learned in classroom to the real-world situations.
2. To Provide Factual Knowledge about Microcontroller Lab Tools
3. To Impart Knowledge about microcontroller Assembly language Programming.
4. To Enhance and Develop techniques for interfacing of Display.

**List of Practical's (15)**

1. Study of Microcontroller Lab Tools Keil uVision and Flash Magic.
2. Arithmetic operations using (Addition and Multiplication)
3. Arithmetic operations (Subtraction and Division)
4. Logical Operations .
5. ALP to move a block of data from one internal memory location to other.
6. ALP to exchange a block of data from one internal memory location to other.
7. ALP to arrange numbers in ascending order.
8. ALP to arrange numbers in descending order.
9. ALP to find smallest number in the array.
10. ALP to square of a 8 bit numbers.
11. ALP to cube of a 8 bit numbers.
12. Program to toggle all the bits of port 1 continuously by sending the values 55H and AAH using Call and return instructions.
13. Write a C program to generate Square wave.
14. Write a C program to generate triangular wave.
15. Interfacing of LCD with 8051 microcontroller.

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Describe Microcontroller operation
2. Explain Microcontroller Lab Tools
3. Illustrate microcontroller Assembly language programme.
4. Demonstrate message will be displayed on the display board.

**Reference Books:**

1. Microcontroller: Architecture, Programming & Applications, Ayala, Kenneth J., 2nd ed, Penram, 2007.
2. Microcontroller And Embedded Systems Using Assembly And C, Muhammad Ali Mazidi, Pearson, 2007.
3. Microcontroller: Internals, Instructions, Programming and Interfacing, Subrata Ghoshal, Pearson Education, 2010.
4. Microcontroller Basics, Davies J H, Elsevier,2011.
5. Microcontroller Programming: An Introduction, Syed R. Rizvi, CRC Press,2011.
6. Microcontroller: Architecture, Assembly Language, And Hardware Interfacing, Craig Steiner, Dreamtech Press, 2012.

**CP-II: D EP202: Project****(Contact Hrs. 60, Credits: 2)**

Every student should take up a project & submit in the report the work he/she has carried out.  
The project work will be assessed independently at the time of practical examination