



Centurion
UNIVERSITY

School of Vocational Education & Training (SoVET)
Diploma in Computer Science Engineering
(2017-20)

Centurion University of Technology and Management (CUTM), Odisha School of Vocational Education and Training (SoVET)							
Teaching and Evaluation Scheme for (3 Year) Diploma in Computer Science Engineering							
3 rd Semester							
Sl. No	Subject Code	Subject	Credits		Evaluation		
			L	P	Internal	External	Total
1	DICS2301	Programming in C	4		30	70	100
2	DICS2302	Digital Electronic Circuit	4		30	70	100
3	DICS2303	Web Technology-I	4		30	70	100
4	DICS2304	Computer Organization	4		30	70	100
5	DICS2305	Programming in C Lab		4	50	50	100
6	DICS2306	Digital Electronic Circuit Lab		2	50	50	100
7	DICS2307	Web Technology-I Lab		2	50	50	100
8	DICS2308	Computer Hardware & Maintenance Lab		4	50	50	100
9	DICS2309	Project & Seminar		2			
10	DICS2310	Learning Reflections (Tutorial / Mentoring)					
		TOTAL	16	14	-	-	-
Abbreviations: L- Learning Lab. , P-Practice							
Minimum Pass mark in each theory and practical is 35% and 50% respectively Contact Hours /Week ➤ Theory-1 Period X Assigned Credit ➤ Practical-1.5 Period X Assigned Credit							

Programming in C

Subject Name	Code	Type of course	T-P-P
Programming in C	DICS2301	Theory	4-0-0

1. Objective

- To introduce to students to the field of programming using C language
- To understand computer programming and its roles in problem solving
- To learn the basic data structures through implementing in C language

2. Learning outcome

- Problem solving through computer programming
- Familiarity of programming environment in Linux operating system
- Students will be able to develop logics which will help them to create programs, applications in C

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Basics of C	6
2	Decision making	10
3	Arrays and Strings	8
4	Functions	8
5	Structure	4
6	Pointers	4
	Total	40

5. Course Contents

Module I

Basics of C:-

History of C, where C stands, C character set, tokens, constants, variables, keywords, C operators (arithmetic, Logical, assignment, relational, increment, and decrement, conditional, bit wise, special, operator, precedence), C expressions data types, Formatted input, formatted output.

Decision making:-

Decision making and branching, if statement (if, if-else, else-if ladder, nested if-else), Switch case statement, break statement. Decision making and looping while, do, do-while statements for loop, continue statement.

Module II

Arrays and Strings:-

Declaration and initialization of one dimensional, two dimensional and character arrays, accessing array elements. Declaration and initialization of string variables, string handling functions from standard library (strlen (), strcpy (), strcat (), strcmp ()).

Functions:-

Need of functions, scope and lifetime of variables, defining functions, function call (call by value, call by reference), return values, storage classes. Category of function (No argument No return value, No argument with return value, argument with return value), recursion

Module III

Structure:-

Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure.

Pointers:-

Understanding pointers, declaring and accessing pointers, Pointers arithmetic, pointers and arrays.

A. Reference

Text Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall, India
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

Reference Books:

4. Seymour Lipschutz, Data Structures, Schaum's Outlines Series, Tata McGraw-Hill
5. Ellis Horowitz, SatrajSahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, W. H. Freeman and Company
6. R. G. Dromey, How to Solve it by Computer, Prentice-Hall of India

Digital Electronics Circuit

Subject Name	Code	Type of course	T-P-P
Digital Electronics Circuit	DICS2302	Theory	4-0-0

1. Objective

- Comprehend the systems and codes.
- Familiar with logic gates.
- Realize logic expressions using gates.
- Construct and verify the operation of arithmetic & logic circuits
- Understand and appreciate the relevance of combinational circuits

2. Learning outcome

- Knowledge of the current pattern of designing an Digital electronic application
- Knowledge of the evolving areas and strategies in electronic applications

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Number Systems And Codes	6
2	Logic Gates	6
3	Boolean Algebra	6
4	Combinational Circuits	8
5	Sequential Circuits	6
6	Logic Families	2
7	Counters	6
8	Registers	6
9	Digital To Analog Converters	5
10	Analog To Digital Converters	5
11	Display Devices	4
Total		60

5. Course Contents

1. NUMBER SYSTEMS AND CODES

1.1 List different number system & their relevance : binary, octal, decimal, Hexadecimal

- 1.2 Study the Conversion from one number system to another.
- 1.3 Perform Arithmetic operations of binary number systems.
- 1.4 Represent the Concept of complementary numbers : 1's & 2's complement of Binary numbers.
- 1.5 Perform Subtraction of binary numbers using complementary numbers.
- 1.6 Perform multiplication and division of binary numbers.
- 1.7 Define concept of Digital Code & its application.
- 1.8 Distinguish between weighted & non-weight Code.
- 1.9 Study Codes : definition, relevance, types (BCD, Gray, Excess-3 and ASCII code and applications).
- 1.10 Generation of Error Detection & Correction Code using parity bit.

2. LOGIC GATES

- 2.1 Illustrate the Different between analog signals & systems and digital signals & Systems.
- 2.2 Discuss the Basic Logic & representation using electric signals.
- 2.3 Learn the Basic Logic gates (NOT, OR, AND, NOR, NAND, EX-OR & EX- NOR) – Symbol, function, expression, truth table & example IC nos.
- 2.4 Define Universal Gates with examples & realization of other gates

3. BOOLEAN ALGEBRA

- 3.1 Understand Boolean : constants, variables & functions.
- 3.2 Comprehend the Laws of Boolean algebra.
- 3.3 State and prove Demorgan's Theorems.
- 3.4 Represent Logic Expression : SOP & POS forms & conversion.
- 3.5 Simplify the Logic Expression/Functions (Maximum of 4 variables) : using Boolean algebra and Karnaugh's map methods.
- 3.6 What is don't care conditions ?
- 3.7 Realisation of simplified logic expression using gates.
- 3.8 Illustrate with examples the above.

4. COMBINATIONAL CIRCUITS

- 4.1 Define a Combinational Circuit and explain with examples.
- 4.2 Arithmetic Circuits (Binary)
 - a) Realise function, functional expression, logic circuit, gate level circuit, truth table & applications of Half-adders, Full-adder & full-Subtractor.
 - b) Explain Serial & Parallel address : concept comparison & application.
 - c) Working of 2 bit Magnitude Comparator : logic expression, truth table, gate level circuit & examples IC
- 4.3 Discuss Decoders : definition, relevance, gate level of circuit of simple decoders, Logic circuit of

high order encoders, truth table & example IC nos.

4.4 Explain the working of Binary-Decimal Encoder & Decoder.

4.5 Discuss Multiplexers : definition, relevance, gate level circuit of simple. Demultiplexers (1:4) logic circuit with truth Table & example IC nos

5. SEQUENTIAL CIRCUITS

5.1 Define Sequential Circuit : Explain with examples.

5.2 Know the Clock-definition characteristics, types of triggering & waveform.

5.3 Define Flip-Flop

5.4 Study RS, Clocked RS, D, T, JK, MS-JK flip-flop with logic Circuit and truth tables.

5.5 Concept of Racing and how it can be avoided.

5.6 Applications of flip-flops & its conversion.

6. LOGIC FAMILIES

6.1 List of various logic families & standard notations.

6.2 Explain propagation Delay, fan-out, fan-in, Power Dissipation & Speed with Reference to logic families.

7. COUNTERS

7.1 List the different types of counters-Synchronous and Asynchronous.

7.2 Explain the modulus of a counter.

7.3 Compare Synchronous and Asynchronous counters and know their ICs nos.

7.4 Explain the working of 4 bit ripple counter with truth table and timing diagram.

7.5 Explain the Synchronous decade counter & binary counter.

8. REGISTERS

8.1 Explain the working of buffer register.

8.2 Explain the working of various types of shift registers – ISO, SIPO, PISO, PIPO with truth table using flip flop.

9. DIGITAL TO ANALOG CONVERTERS

9.1 Explain the performance parameters of ADC-Resolution, Accuracy and Conversion time.

9.2 Explain Binary Weighted resistor DAC.

9.3 Explain the Successive – Approximation type DAC

9.4 Explain R-2R Ladder type DAC.

10. ANALOG TO DIGITAL CONVERTERS

10.1 Explain the performance parameters of ADC-Resolution, Quantization Error and conversion time.

10.2 Explain the Ramp type and Dual Slope ADC's

10.3 Explain the Successive – Approximation type ADC

11.1 Explain the operation of LED and concept of seven segment display.

11.2 Explain the LCD and its types.

11.3 Compare between LED's and LCD's.

11.4 Explain LED driver using IC 7447 decoder.

11.5 Explain 7 segment decoder/driver for LCD display.

B. Reference

Text Books:

1. **Digital Design** M. Morris Mano, Michael D Ciletti Pearson
2. **Digital Circuits and Design** S Salivahanan, SARivazhagan Vikas Publishing House Pvt Ltd.

Reference Books:

3. **Digital Fundamentals** : Thomas L. Floyd, R. P. Jain Pearson

Web Technology -I

Subject Name	Code	Type of course	T-P-P
Web Technology -I	DICS2303	Theory	4-0-0

1. Objective

- To give students the basic understanding of how things work in the Web world from the technology point of view.
- To give the basic overview of the different technologies.
- To gain the skills and project - based experience needed for entry into web application and development careers.

2. Learning outcome

- Students will be able to write a well formed / valid XML/HTML document.
- Use fundamental skills to maintain web server services required to host a website
- Use scripting languages and web services to transfer data and add interactive components to web pages.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Internet Basics	8
2	Navigation Tools	6
3	Developing Portals Using HTML	12
4	Java Script	12
5	Concept of CSS	8
6	PHP	8
Total		54

5. Course Contents

Module I [14 hour]

Internet Basics: Concept, Application and use of internet in various fields of Science and Technology, Establishing Connectivity on Internet,

Email: SMTP, www, Telnet, IP Address, Brief overview of TCP/IP

Navigation Tools: Netscape and Internet Explorer to surf Internet, Uniform Resource Locator (URL)

Hypertext, hyperlinks and hypermedia, its registration, browsers, search engines, proxy servers, Internet Applications: E-mail, Telnet, FTP, IRC, NNTP, Video conferencing, e-commerce.

Module II [18 hour]

Developing Portals Using HTML:-Basic structure of HTML, designing a web page, inserting links images, horizontal rules, comments. Formatting text, title, headings, colors, fonts, sizes, simple tables and forms. Introduction WEB publishing, HTML tag concept, <head><body>, URL, hyperlinks <link>href, <A> tags. HTML tags, hyperlinks. Adding graphics and images, image maps, image files. Using tables, forms, style sheets and frames

Java Script: Java script in web pages, Advantages of JavaScript, Writing JavaScript into HTML, Programming- Data types and Literals, Type casting, Variables, Arrays, Operators and Expressions, Conditional and Iterative Loops, Functions, Dialog Boxes, Cookies

Module III [16 hour]

Concept of CSS: Creating Style Sheet, types of style sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects Working with Lists and Tables, CSS Id and Class Box Model(Introduction, Border properties, Padding Properties, Margin properties), CSS Color.

PHP: Introduction & Installation, PHP data types, Variables, Constants, String and Regular Expressions, Operators, Conditional Statements, Looping statements and Function.

C. Reference

Text Books:

1. Internet 6-in-1 by Kraynak and Habraken, Prentice Hall of India Pvt. Ltd., New Delhi
2. Using the Internet IV edition by Kasser, Prentice Hall of India Pvt. Ltd., New Delhi
3. Using the World Wide Web, (IInd edition) by Wall, Prentice Hall of India Pvt. Ltd., New Delh

Computer Organization

Subject Name	Code	Type of course	T-P-P
Computer Organization	DICS2304	Theory	4-0-0

1. Objective

- To have a thorough understanding of the basic structure and operation of a digital computer.
- Explain the instruction set architecture and its importance in the design of computer systems
- Explaining the computer-hardware subsystems

2. Learning outcome

- Distinguishing between different type of memory
- Solving different type of memory problem
- Understanding the Addressing concept of memory
- Explain the working of pipelining process

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Introduction to Computer Organization	2
2	Addressing modes CPU Design Reduced instruction set computers	4
5	Memory organization	8
6	I/O organization	8
7	DMA Data Transfer	6
8	Interconnection Networks	6
	Total	34

5. Course Contents

Module I

Introduction : Hardware organization of computer system ,CPU organization : general register organization, stack organization, instruction ,formats(three address, two address, one address, zero address and RISC instruction).

Addressing modes: Immediate, register, direct, in direct, relative, indexed.

CPU Design: Micro programmed vs hard wired control.

Reduced instruction set computers: CISC characteristics, RISC characteristics, and their comparison.

Module II

Memory organization

Memory Hierarchy

RAM and ROM chips, Memory address map, Memory connections to CPU.

Auxiliary memory : Magnetic disks and magnetic tapes. Associative memory Cache memory Virtual memory Memory management hardware

I/O organization :

Basis Input output system(BIOS) ,Function of BIOS Testing and initialization, Configuring the system . Modes of Data Transfer

Programmed I/O: Synchronous, asynchronous and interrupt initiated.

Module III

DMA Data Transfer:-

Architecture of multi processor systems, Forms of parallel processing, Parallel processing and pipelines, basic characteristics of multiprocessor.

Interconnection Networks :time shared common bus, multi port memory, cross bar switch, multi stage switching networks and hyper cube structures

D. Reference

Text Books:

1. Computer Architecture and Organisation by Moris Mano
2. Computer Architecture by J.P.Hayes
3. Structured Computer Organisation ByTanenbaum Andrew S, Ph
4. Computer Organization: Carl Hamacher, Zvonkovranesic, SafwatZaky,McGraw Hill,5th Ed .

Programming in C Lab

Subject Name	Code	Type of course	T-P-P
Programming in C Lab	DICS2305	Practice	0-6-0

1. Objective

- To provide students with understanding of code organization and functional hierarchical decomposition with using complex data types
- To understand and develop well-structured programs using C language

2. Learning outcome

- Understanding a functional hierarchical code organization.
- Ability to define and manage data structures based on problem subject domain.
- To write diversified solutions using C language

3. Evaluation Systems

<i>Internal Examination</i>	<i>Component</i>	<i>% of Marks</i>	<i>Method of Assessment</i>
	Experiments	40	Lab work, report
	Quiz (viva)	10	Surprise/preannounced ones
<i>External Examination</i>		50	Written examination
<i>Total</i>		100	

4. Course Contents

Sl. No	Topics	Periods
1	Programming Exercise on Executing and Editing a C Program.	3
2	Programming Exercise on defining Variable and assigning values to variables.	3
3	Programming Exercise on arithmetic's and relational operators.	3
4	Programming Exercise on arithmetic expression and their evaluation.	3
5	Programming Exercise on formatting input/output using printf and scanf	3
6	Programming Exercise using if-statement.	3
7	Programming Exercise using if-else statement.	3
8	Programming Exercise on switch statement	3
9	Programming Exercise on do-while statement.	3
10	Programming Exercise on for statement.	3
Total		30

Digital Electronics Lab

Subject Name	Code	Type of course	T-P-P
Digital Electronics Lab	DICS2306	Practice	0-3-0

1. Objective

- Familiarized with use of Digital ICs.
- Understand and comprehended the simple the Digital design Circuits.
- Know A/D & D/A conversions.

2. Learning outcome

Key points: State clearly what knowledge and skill a student is expected to learn at the end of the course.

- Knowledge of the current pattern of designing an digital electronic application
- Skill on designing and testing of the digital electronic component and circuits

3. Evaluation Systems

Internal Examination	Component	% of Marks	Method of Assessment
	Experiments	40	Lab work, report
	Quiz (viva)	10	Surprise/preannounced ones
External Examination		50	Written examination
Total		100	

4. Course Contents

Sl. No	Topics	Periods
1	Familiarization of Digital Trainer, Kit, logic Pulse, Logic Probe & Digital ICs i.e., 7400, 7402, 7404, 7408, 7432 & 7486.	3
2	Verify truth tables of AND, OR, NOT, NOR, NAND, XOR, XNOR gates.	3
3	Implement various gates by using universal properties of NAND & NOR gates and verify truth table.	3
4	Implement half adder and Full adder using logic gates.	3
5	Implement half subtractor and Full subtractor using logic gates.	3
6	Implement a 4-bit Binary to Gray code converter.	3
7	Implement a Single bit digital comparator.	3
8	Study Multiplexer and demultiplexer.	3
9	Study of flip-flops. i) S-R flip flop ii) J-K flip flop iii) flip flop iv) T flip flop	3
10	Realize a 4-bit asynchronous UP/Down counter with a control for up/down counting.	3
11	Realize a 4-bit synchronous UP/Down counter with a control for up/down counting.	3
12	Implement Mode-10 asynchronous counters.	3
13.	Study shift registers	3
14	Study 8-bit D/A and A/D conversion.	3
15	Study display devices, LED, LCD, 7-segment displays.	3
Total		45

Web Technology-I Lab

Subject Name	Code	Type of course	T-P-P
Web Technology-I Lab	DICS2307	Practice	0-3-0

1. Objective

- Write syntactically correct HTTP messages and describe the semantics of common HTTP methods and header fields
- Select and apply markup languages for processing, identifying, and presenting of information in web pages.
- Incorporate aesthetics and formal concepts of layout and organization to design websites that effectively communicate using visual elements.

2. Learning outcome

- Incorporate best practices in navigation, usability and written content to design websites that give users easy access to the information they seek.
- Design websites using appropriate security principles, focusing specifically on the vulnerabilities inherent in common web implementations.
- Incorporate best practices in navigation, usability and written content to design websites that give users easy access to the information they seek.

3. Evaluation Systems

<i>Internal Examination</i>	<i>Component</i>	<i>% of Marks</i>	<i>Method of Assessment</i>
	Experiments	40	Lab work, report
	Quiz (viva)	10	Surprise/preannounced ones
<i>External Examination</i>		50	Written examination
<i>Total</i>		100	

4. Course Contents

Sl. No	Topics	Periods
1	Configuring computer system to access internet	3
2	Using e-mail	3
3	Using WWW for accessing relevant information	3
4	Creating Web pages using HTML	3
5	Creating web pages using front page	3
6	Demonstration of audio-video conferencing	3
7	Demonstration of e-commerce transaction	3
8	Design of Forms using Java Script or Visual Basic Script	3

9	Validation of user queries and responses in the Forms using Java Script or VB script	3
10	Create a Homepage with frames, animation, background sound and hyperlinks .	3
11	Design fill-out form with text, check box, radio buttons etc and embed Java script or VB script to validate users input.	3
12	Develop interface with database (MS-Access etc) for online retrieval and storage of data through HTML form.	3
Total		36

Computer Hardware and Maintenance Lab

Subject Name	Code	Type of course	T-P-P
Computer Hardware And Maintenance Lab	DICS2308	Practice	0-6-0

1. Objective

- Build an understanding of the fundamental concepts of computer hardware.
- Developing skills to become professional technician with capability to handle and maintenance of computer hardware and network.

2. Learning outcome

- Identify the different types of computer hardware and their use.
- An ability to use the techniques, skills, and modern engineering tools necessary for setting up a computer network.
- Understand and building the skills of assembling and disassembling computer system

3. Evaluation Systems

<i>Internal Examination</i>	<i>Component</i>	<i>% of Marks</i>	<i>Method of Assessment</i>
	Experiments	40	Lab work, report
	Quiz (viva)	10	Surprise/preannounced ones
<i>External Examination</i>		50	Written examination
<i>Total</i>		100	

4. Course Contents

Sl. No	Topics	Periods
1	Drawing the motherboard layout of Pentium IV and studying the chipset through data books or Internet.	3
2	Hard Disk Partitioning	6
3	Study of HDD: Identify various components of HDD and write their functions.	6
4	Study and installation of any one display cards: VGA or SVGA display cards.	3
5	Installation of Scanner, Printers and Modems.	6
6	Study of SMPS (ATX).	3
7	Study of Diagnostic Software's. (Any one)	3
8	Fault findings: Problems related to monitor. Problems related to CPU.	6

9	Assembling of PC and Installation of Operating System.	6
10	Configuration of Client and Server PC, Laptop and Network components.	6
11	RS232C communication between two computers	3
12	LAN wire setup.	6
Total		57