

**GURU KASHI UNIVERSITY**



**Diploma in Computer Application  
Session: 2023-2024**

**Department of Computer Applications**

**Programme Structure**

<b>Semester-I</b>						
<b>Course Code</b>	<b>Course Title</b>	<b>Type of course</b>				
			<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
DCA101	Fundamentals of Computer	Core	4	0	0	4
DCA102	Operating Systems	Core	4	0	0	4
DCA108	Fundamentals of Web Technology	Core	4	0	0	4
DCA103	Effective Communication Skills	Compulsory Foundation	4	0	0	4
DCA109	Fundamentals of Web Technology Lab	Technical Skill	0	0	6	3
DCA106	Effective Communication Skills Lab	Technical Skill	0	0	4	2
DCA105	Office Automation Systems Lab	Compulsory Foundation	0	0	6	3
<b>Total</b>			<b>16</b>	<b>0</b>	<b>16</b>	<b>24</b>

<b>Semester-II</b>						
<b>Course Code</b>	<b>Course Title</b>	<b>Type of course</b>				
			<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
DCA202	Programming in C	Core	4	0	0	4
DCA203	Data Structures	Core	4	0	0	4
DCA207	Database Management Systems	Core	4	1	0	5
DCA204	Programming in C Lab	Technical Skill	0	0	6	3
DCA208	Database Management Systems Lab	Technical Skill	0	0	6	3
DCA209	PC Assembling & Troubleshooting Lab	Technical Skill	0	0	6	3
DCA210	Digital Electronics	VAC	2	0	0	2
<b>Total</b>			<b>14</b>	<b>1</b>	<b>18</b>	<b>24</b>

**Evaluation Criteria for Theory Courses**

- A. Continuous Assessment: [25 Marks]
  - CA1: Surprise Test (Two best out of three) (10 Marks)
  - CA2: Assignment(s) (10 Marks)
  - CA3: Term Paper/Quiz/Presentation (5 Marks)
- B. Attendance (5 marks)
- C. Mid Semester Test: [30 Marks]
- D. End-Term Exam: [40 Marks]

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**Semester-I****Course Title: Fundamentals of Computer****Course Code: DCA101**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
4	0	0	4

**Total Hours: 60****UNIT I****15 hours**

Computer Fundamentals: Block diagram of a computer, characteristics of computers and generations of computers.

Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

Binary Arithmetic: Addition, subtraction and multiplication.

**UNIT II****15 hours**

Computer Codes: weighted and non-weighted code, BCD, EBCDIC, ASCII,

Unicode. Input Devices: Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices, Optical Recognition devices – OMR, OBR, OCR

Output Devices: Monitors, Printer and its Types.

**UNIT – III****15 hours**

Memories: Units of Memory, Main Memories - RAM, ROM and Secondary Storage Devices - Hard Disk, Compact Disk, DVD.

Computer languages: Machine language, assembly language, higher level language, 4GL.

**UNIT – IV****15 hours**

Introduction to Compiler, Interpreter and Assembler.

Computer Software: Need, Types – System software, Application software

Internet: Basic Internet terms: Web Page, Website, Home page, Browser, URL, Hypertext, Web Server, Applications: WWW, e-mail, Instant Messaging, Videoconferencing. Computer Virus Virus, Types of Viruses Virus detection and prevention.

**Suggested Readings**

1. P.K. Sinha and P. Sinha (2002), *Foundations of Computing*, First Edition, BPB.
2. D. H. Sanders (1988), *Computers Today*, Fourth Edition, McGraw Hill.
3. V. Rajaraman (1996), *Fundamentals of Computers*, Second Edition, Prentice Hall of India, New Delhi.
4. Satish Jain (1999), *Information Technology*, Paperback Edition, BPB.

**Web Sources**

1. <https://www.javatpoint.com/computer-fundamentals-tutorial>
2. <https://byjus.com/govt-exams/computer-fundamentals/>
3. [https://ashishmodi.weebly.com/uploads/1/8/9/7/18970467/computer\\_fundamental.pdf](https://ashishmodi.weebly.com/uploads/1/8/9/7/18970467/computer_fundamental.pdf)
4. <https://www.chtips.com/computer-fundamentals/what-is-computer-fundamentals/>

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**Course Title: Operating Systems****Course Code: DCA102**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
4	0	0	4

**Total Hours: 60****Course Content****UNIT-I****15 hours**

Introduction: Operating system Meaning, Supervisor & User mode, Operating system operations & Functions, Types of OS.

**UNIT-II****15 hours**

Process management: Process Concept, PCB, Process Scheduling, Cooperating Processes, Overview of Inter Process Communication, Context Switching, scheduling criteria, Type of Scheduling: Long term, Short term & Medium term scheduling, scheduling algorithms, Deadlock concept & handling.

**UNIT-III****15 hours**

Memory Management: Logical & Physical Address space, Swapping, Contiguous memory allocation, paging, segmentation, Virtual memory, demand paging, Overview of Page replacement, Thrashing.

**UNIT-IV****15 hours**

Secondary Storage Structure: disk structure, Disk Scheduling, disk management, swap space management.

**Suggested Readings**

1. Tanenbaum, A. (2009). *Modern operating systems*. Pearson Education, Inc.,
2. Coffman, E. G., & Denning, P. J. (1973). *Operating systems theory* (Vol. 973). Englewood Cliffs, NJ: prentice-Hall.
3. Madnick, S. E., & Donovan, J. J. (1974). *Operating systems* (Vol. 197, No. 4). New York: McGraw-Hill.
4. Deitel, H. M. (1990). *An introduction to operating systems*. Addison-Wesley Longman Publishing Co., Inc.

**Web Sources**

1. <https://edu.gcfglobal.org/en/computerbasics/understanding-operating-systems/1/>
2. <https://www.techtarget.com/whatis/definition/operating-system-OS>
3. <https://www.geeksforgeeks.org/what-is-an-operating-system/>
4. [https://www.tutorialspoint.com/operating\\_system/os\\_overview.htm](https://www.tutorialspoint.com/operating_system/os_overview.htm)

**Course Title: Fundamentals of Web Technology****Course Code: DCA108**

L	T	P	Credits
4	0	0	4

**Total Hours: 60****Course Content****UNIT I****15 hours**

Basics of Internet and Web The basics of Internet, World Wide Web, Web page, web browsers, URL, MIME, HTTP, Web Programmers Toolbox  
 Html Common Tags: List, Tables, images, forms, frames, basics of CSS and types of CSS.

**UNIT II****15 hours**

Introduction to HTML to XHTML: origin and evaluation of html, basics syntax, Standard Html document structure and basics Syntax, Basics of text documents, images hypertext, lists, tables, frames, forms, Multimedia in HTML.

**UNIT - III****15 hours**

Cascading Style Sheet: Introduction and levels of cascading Style Sheet Style Specification Formats, Styles Classes, properties and properties value, color, <span> and<div> tags.

**UNIT - IV****15 hours**

Introduction to Java Script: Basic of Java Script and Document Object Model, Element Access in Java Script, event and event handling, Dom event and element Positioning, Moving Element and Element Positioning, Changing Color and Font. Dragging and Dropping Elements

**Suggested Readings**

1. P.K. Sinha and P. Sinha (2002), *Foundations of Computing*, First Edition, BPB.
2. D. H. Sanders (1988), *Computers Today*, Fourth Edition, McGraw Hill.
3. V. Rajaraman (1996), *Fundamentals of Computers*, Second Edition, Prentice Hall of India, New Delhi.
4. Satish Jain (1999), *Information Technology*, Paperback Edition, BPB.

**Web Sources:**

1. <https://www.geeksforgeeks.org/web-technology/>
2. <https://genuinenotes.com/wp-content/uploads/2020/02/Web-Technology-Notes-all.pdf>
3. <https://www.rgmcet.edu.in/assets/img/departments/CSE/materials/R15/3-2/Web%20Technologies.pdf>
4. [https://studyglance.in/lecturenotes/display.php?tno=8&subject=Web%20Technologies&title=Web%20Technologies%20\(UNIT-2%20\)%20Lecture%20Notes](https://studyglance.in/lecturenotes/display.php?tno=8&subject=Web%20Technologies&title=Web%20Technologies%20(UNIT-2%20)%20Lecture%20Notes)



**Course Title: Effective Communication Skills****Course Code: DCA103**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
4	0	0	4

**Total Hours: 60****UNIT I****15 hours**

English Language: Sentence, Parts of speech, Tenses, Active passive voice, Direct/Indirect speech, Creative writing & vocabulary, Comprehension passage, Reading of Biographies of at least 10 IT business personalities.

**UNIT – II****15 hours**

Business communication: Types, Medias, Objectives, Modals, Process, Importance Understanding Barriers to communication & ways to handle and improve barriers.

Listening skills: Its importance as individual and as a leader or as a worker, Types of listening and Traits of a good listener, Note taking, barriers to listening & remedies to improve listening barriers

**UNIT – III****15 hours**

Nonverbal Communication- understanding what is called nonverbal communication, its importance as an individual, as a student, as a worker and as a leader, its types.

Presentation skills-Its Purpose in business world, how to find material for presentation, how to sequence the speech with proper introduction and conclusion, how to Prepare PPT & Complete set of required body language while delivering presentation.

**UNIT IV****15 hours**

Reading Skills- to enhance independent reading, Comprehension Passages, News / Magazine articles on stereotype topics, Poems – Abu Ben Adhem, The Tiger

Writing skills- Importance of reading and writing, improving writing skills through Basic cohesive paragraph writing, Resume writing, Job application writing/acceptance letter

**Suggested Readings**

1. Kumar, S., &Lata, P. (2011). Communication skills. Oxford University Press.
2. Training, M. T. D. (2012). Effective communication skills. Bookboon.
3. Hargie, O. (Ed.). (1986). The handbook of communication skills (p. 37). London: Croom Helm.

**Web sources**

1. <https://www.coursera.org/articles/communication-effectiveness>
2. <https://www.knowledgehut.com/blog/project-management/effective-communication>

3. <https://in.indeed.com/career-advice/resumes-cover-letters/communication-skills>
4. <https://www.skillsyouneed.com/ips/improving-communication.html>

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**Course Title: Fundamentals of Web Technology Lab**  
**Course Code: DCA109**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
0	0	6	3

**Total Hours: 90**

**Course Outcomes:**

**List of Experiments**

1. Design the page with an attractive background color, text color and background image.
2. Design the page with an attractive color combination, with suitable headings and horizontal rules.
3. Write an HTML document with an example of Ordered List and Unordered List.
4. Write an HTML document with an example of Table format to print your Bio-Data.
5. Write an HTML document with an example of Table format to print your Telephone Bill.
6. Develop a complete web page using Frames and Frameset.
7. Write an HTML code for designing the subscription form of mail account in the e-mail website with appropriate fields.
8. Write an example of a Style Sheet.
9. Design a webpage with colors in bgcolor, text and link, try out different sizes.
10. Design a single page web site for a university containing a description of the courses offered, it should also contain some general information about the university such as its history.
11. Write a HTML code for specifying the heading BS or cities in the HTML document.
12. Write a HTML Code for Nested list.
13. Write HTML code to develop a web page having background in blue and title "Welcome to my home page" in red other color.
14. Create an HTML document giving details of your name, age, telephone no, address and enrolment no, aligned in proper order.
15. Design a web page that provides links to five different web pages or to entirely different websites.

**Course Title: Effective Communication Skills Lab**  
**Course Code: DCA106**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
0	0	4	2

**Total Hours: 60**

### **Course Content**

#### **UNIT I**

**15 hours**

Listening Practices: Listen and takes notes of Lecture, Listen and Write appropriate word, Talks on Engineering and Technology, Developing effective listening skills, barriers to effective listening

#### **UNIT II**

**15 hours**

Speaking: Self-Introduction, Role play of Celebrities, Sharing memorable incidents

Reading: Reading Online Blogs, Reading Advertisement in Online, Newspaper archives reading

#### **UNIT III**

**15 hours**

Writing Process Description, narrating experiences, Creating Email blogs, Review Writing – Books, Movies, and Journals

Summarized Activities:

Reading – cloze exercises, identifying redundant words, Jargon words, foreign words, Technical terms

#### **UNIT IV**

**15 hours**

Writing – Error free sentences, Sequential paragraphs, Essay writing on various levels – basic, middle, and advanced

Speaking – Face to face conversation on specific topics, interviewing celebrities, getting acquainted with new people, sharing information with persons from abroad.

**Course Title: Office Automation System  
Lab**  
**Course Code: DCA105**

L	T	P	Credits
0	0	6	3

**Total Hours: 90**

**List of Experiments**

1. [MS-WORD] Creating, opening, closing, saving and editing a word Document.
2. [MS-WORD] Insert header and footer in the document.
3. [MS-WORD] Create a link between two files using Hyperlink.
4. [MS-WORD] Create a mail-merge and add data of 5 recipients.
5. [MS-WORD] Protect a document.
6. [MS-WORD] Implement macro.
7. [MS-POWERPOINT] Create duplicate slides in PowerPoint. Give an example.
8. [MS-POWERPOINT] Make a master slide.
9. [MS-POWERPOINT] Design a chart of population.
10. [MS-POWERPOINT] Insert Animation.
11. [MS-POWERPOINT] Insert a background in PowerPoint.
12. [MS-EXCEL] How you can filter your data.
13. [MS-EXCEL] Sort data in ascending and descending order.
14. [MS-EXCEL] To show the use of goal seek
15. [MS-EXCEL] To show the use of scenarios.
16. [MS-EXCEL] Perform any 5 Date and Time functions.
17. [MS-EXCEL] Perform any 5 Math & Trig functions.

**Course Title: Programming in C**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
4	0	0	4

**Course Code: DCA202****Total Hours: 60****Course Outcomes**

On the completion of the course the students will be able to

1. Develop confidence for self-education and ability for life-long learning needed for Computer language.
2. Handle possible errors during program execution.
3. Build logic used in Programming.
4. Design and develop Computer programs, analyses, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.

**Course Content****UNIT I****15 hours**

Introduction: ANSI C standard, Overview of Compiler and Interpreters, Structure of C Program, Programming rules, Execution  
 Basic structure of C program: Character set, Identifiers and keywords, constants, variable, Data types, input and output, type conversion, Operators and expressions: Arithmetic, Unary, Logical and Relational operators, assignment operators, Conditional operators, type conversion. Library functions.

**UNIT II****15 hours**

Input/ Output in C: Formatting input; output functions.  
 Decision making statements – if, else if  
 Control statements: branching, looping using for, While and Do-While statements, nested control structures, switch, break and continue statements.

**UNIT III****15 hours**

Arrays: Definition, declaration, assignment, one dimensional and two dimensional arrays.  
 Strings: input/output of strings, string handling functions, table of strings.  
 Pointers: pointer data type, pointer declaration, initialization, accessing values using pointers.  
 Functions: prototype, definition and call, formal and actual arguments, methods of parameter passing to functions, recursion versus iteration.

**UNIT IV****15 hours**

Structures and unions: using structures and unions, comparison of structure with arrays and union.  
 Files: opening and closing files, Basic I/O operation on files.  
 Storage Classes: automatic, external, static and register variables.

## Suggested Readings

1. Balagurusamy, *Programming in C*, Tata McGraw Hill.
2. Kanetkar, Y. (2018). *Let us C*. BPB publications.
3. Hanly, J. R., & Koffman, E. B. (2007), *Problem solving and program design in C*, Pearson Education India.

### Web Sources:

1. <https://www.codewithharry.com/videos/c-tutorial-in-hindi-with-notes/>
2. <https://byjus.com/gate/introduction-to-c-programming/>
3. <https://cstutorialpoint.com/c-language-notes/>
4. <https://www.geeksforgeeks.org/c-language-introduction/>

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**Course Title: Data Structures****Course Code: DCA203**

L	T	P	Credits
4	0	0	4

**Total Hours: 60****Course Content****UNIT I****15 hours**

Introduction: definition, various types of data structures, data structure operations, algorithms complexity and Time Space Trade-off.

Arrays and Records: Linear arrays, Representation of linear arrays in memory, Operations on Array, Multidimensional arrays and its implementation, Pointers, pointer arrays, Records.

**UNIT II****15 hours**

Stacks: Stacks, array representation of stacks, operation on stacks, Polish Notation, Notation conversion, evaluation of postfix expression, Applications of Stack.

Queues: Queues, implementation, operations on queue, Dequeuees, Priority queues.

**UNIT III****15 hours**

Linked Lists: Linked lists, Representation in memory, traversing link lists, operations on link list, overflow and underflow, Memory allocation, Header link list, two way lists.

Trees: Basic terminology, Binary trees and its representation, Complete binary tree, Extended binary tree, linked representation of binary tree, traversing binary tree, searching binary tree, Binary search trees.

**UNIT IV****15 hours**

Sorting and Searching: Definitions, bubble sort, insertion sort, selection sort, quick sort, merge sort, radix sort, heap sort, Quick Sort, Linear Search, Binary Search.

Graphs: representation of graph, types of Graph, adjacency matrices, path matrix, Graph traversal: Breadth first search. Depth first search, shortest path problem: Warshall's algorithm, Dijkstra algorithm.

**Suggested Readings**

1. Hubbard, J. R. (2007), *[Introduction to] Schaum's Outline of Data Structures with Java*, McGraw-Hill.
2. Horowitz, E., & Sahni, S. (1976), *Fundamentals of data structures* (Vol. 1982), Potomac, MD: Computer science press.
3. Wirth, N. (1985), *Algorithms & data structures*, Prentice-Hall, Inc..
4. Tarjan, R. E. (1983), *Data structures and network algorithms*, Society for industrial and Applied Mathematics.

**Web Sources**

- <https://byjus.com/gate/introduction-to-data-structure-notes/>
- <https://www.geeksforgeeks.org/data-structures/>
- <https://www.javatpoint.com/data-structure-tutorial>



- <https://www.studocu.com/row/document/university-of-benin/data-structure/data-structures-lecture-notes-for-data-structure/5448262>

IOAIC

**Course Title: Database Management System****Course Code: DCA207**

L	T	P	Credits
4	1	0	5

**Total Hours: 75****Course Content****UNIT I****15 hours**

**Introduction to databases:** Characteristics of database approach, data models, database system architecture, data independence and data abstraction.

**UNIT II****20 hours**

Data modeling: Entity relationship (ER) modeling: Entity types, relationships, constraints, ER diagrams, EER model. Relation data model: Relational model concepts, relational constraints, relational algebra.

**UNIT III****20 hours**

SQL queries: SQL data definition, data types, specifying constraints, Queries for retrieval, insertion, deletion, updation, introduction to views

**UNIT IV****20 hours**

Database design: Mapping ER/EER model to relational database, functional dependencies, Lossless decomposition, Normal forms (upto BCNF).

Transaction and data storage: Introduction to transaction processing: ACID properties, concurrency control; Introduction to indexing structures for files.

**Suggested Readings**

- Ramakrishnan, R., Gehrke, J., &Gehrke, J. (2003). *Database management systems (Vol. 3)*. New York: McGraw-Hill.KorthF. Henry. *Database System Concepts*, McGraw Hill.
- Lu, G. (1999). *Multimedia database management systems*. Boston: Artech House.
- Date, C. J. (1975). *An introduction to database systems*. Pearson Education India.

**Web Sources**

- <https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/><https://www.javatpoint.com/dbms-tutorial>
- <https://www.techopedia.com/definition/24361/database-management-systems-dbms>

**Course Title: Programming in C Lab**  
**Course Code: DCA204**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
0	0	6	3

**Total Hours: 90**

### **List of Experiments**

1. Program to find sum of two numbers.
2. Program to test whether an entered number is even, odd or zero.
3. Program to test whether an entered number is a prime number or not.
4. Program to print N terms of a Fibonacci Series.
5. Program to find the reverse of a number.
6. Program to check whether a given Number or a given string is palindrome or not.
7. Program to reverse a given string.
8. Program to check whether a given number is prime or not.
9. Program to find the prime numbers up to N.
10. Program to print:  
 \*  
 \*\*  
 \*\*\*  
 \*\*\*\*  
 \*\*\*\*\*
11. Program to search a string in an array using read-data.
12. Program to find the frequency of vowels in a given string.
13. Program to find the frequency of each character in a given string.
14. Program to find greatest in a matrix using subroutine.
15. Program for Matrices Addition. And subtraction.
16. Program for Matrix Transpose.
17. Program to find sum of rows and columns of a matrix.
18. Program to find sum of both diagonals of the matrix.

**Course Title: Database Management Systems Lab**  
**Course Code: DCA208**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
0	0	6	3

**Total Hours: 90**

**List of Experiments**

1. Introduction to DBMS & SQL.
2. To implement Various DDL comments.
3. Implement the DML commands.
4. Study of Various types of data Constraints and implementation.
5. Study of all types of operators.
6. Implement the concept of Set Operators.
7. Explore select clauses -order by, having etc.
8. Implement the concept of Inbuilt Function.
9. Implement the concept of Joins,
10. Implement the concept of views.
11. Implement the concept of Indexes

**Course Title: PC Assembling & Troubleshooting Lab****Course Code: DCA209**

<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
0	0	6	3

**Total Hours: 90****List of Experiments**

1. Introduction of Hardware and Software/components of computer.
2. Mother boards, Chipsets & Microprocessor concept & latest available in market.
3. Basics & Types of Floppy drive/HDD/DVD/RAM /SMPS/ /BIOS.
4. Assembling different parts of computers.
5. Knowing ports, wires attached in the Computer.
6. Installation of OS (Linux/Windows).
7. Installation of application and utility software.
8. Networking Basics: Different types of Topologies and their configuration.
9. Types of Switches, I/O Sockets.
10. Creation of Cross Wires and Direct Cables.
11. IP & Setting up a computer on LAN.

**Course Title: Digital Electronics****Course Code: DCA210**

L	T	P	Credits
2	0	0	2

**Total Hours: 30****Course Content****UNIT I****10 hours**

Fundamental Concepts: Introduction to Analog and Digital Systems, Digital Signals, Basic Digital Circuits: AND, OR, NOT, NAND, NOR, XOR and XNOR gates.

**UNIT II****10 hours**

Combinational Logic Design: SOP and POS Representation of Logic functions, K-Map Representation Multiplexers: 4X1, 8X1 and 16X1. Demultiplexers: 1 to 4, 1 to 8 and 1 to 16.

**UNIT III****5 hours**

Flip-Flops: Introduction, Latch, Clocked S-R Flip Flop, Preset and Clear signals, D-Flip Flop, J-K Flip Flop

**UNIT IV****5 hours**

Analog to Digital Converters: Quantization and encoding, Parallel-comparator A/D converter, Counting A/D converter.

**Transactional Mode**

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

**Suggested Readings**

- Jain, R. P. (2003). *Modern digital electronics*. Tata McGraw-Hill Education.
- Maini, A. K. (2007). *Digital electronics: principles, devices and applications*. John Wiley & Sons.
- Pedroni, V. A. (2008). *Digital electronics and design with VHDL*. Morgan Kaufmann.
- Balch, M. (2003). *Complete digital design: a comprehensive guide to digital electronics and computer system architecture*. McGraw-Hill Education.

**Web Sources**

- <https://www.javatpoint.com/digital-electronics>
- <https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials>.
- [https://www.tutorialspoint.com/digital\\_circuits/index.html](https://www.tutorialspoint.com/digital_circuits/index.html).
- <https://byjus.com/physics/digital-electronics>.