CHRIST COLLEGE
OF SCIENCE AND MANAGEMENT
(Affiliated to Bengaluru North University, Recognized by Govt. of Karnataka)
Hosur-Malur Main Road, Alambady, Malur, Karnataka - 563160

CERTIFICATE COURSE	
COURSE NAME	Digital Principles and Computer Organization
COURSE CODE	CAP 01
YEAR OF INTRODUCTION	2022-23
YEAR OF OFFERING	2022-23
STAFF IN CHARGE	Ms. AYASHA
COURSE OFFERED TO	I Year BCA

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Course Code	Course Name	L-T-P	Credits	Year of Introduction
CAP 01	Digital Principles and Computer Organization	3 hour / week	1	2021

DEPARTMENT OF COMPUTER SCIENCE
ACADEMIC YEAR 2022-23 (I SEM)

CAP OFFERED FOR I SEMESTER NEP BATCH BCA STUDENTS

Syllabus

Course Code: CAP-01	Course Title: Digital Principles and Computer Organization
Semester 1	Summative Assessment Marks: 50
Total Contact Hours: 45	Formative Assessment Marks: 50
Exam Marks: 100	Exam Duration: 03 Hours

Unit I

Number Systems and Codes: Binary Number system – Binary to decimal –decimal to binary – hexa decimal – ASCII code – Excess-3 Code – Gray code. Digital Logic: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND. **(6 Hours)**

Unit II

Combinatorial Logic Circuits: Half Adder –Full Adder, Half Subtractor-Full Subtractor, Boolean Laws and Theorems. - Truth table to Karnaugh Map – Pairs, Quads, Octets – Don't Care Conditions. **(6 Hours)**

Unit III

Arithmetic Circuits: Binary Addition- Binary Subtraction – 2'S Complement Representation -2'S Complement Arithmetic. Addition and Subtraction using 1's and 2's complement. **(4 Hours)**

Unit IV

Basic Computer organization and Design: Instruction codes - stored program organization - Computer registers and common bus system - Computer instructions - Timing and control - Instruction cycle: Fetch and Decode - Register reference instructions. **(6 Hours)**

Unit V

Central Processing Unit: General register organization - stack organization – instruction formats - addressing modes - Data transfer and manipulation - Program control. CISC and RISC.

(8 Hours)

References

1. Digital Principles and Applications – Donald P Leach, Albert Paul Malvino, GoutamSaha, 8th edition , McGraw-Hill Education, 3rd reprint 2015.

2. Computer System Architecture, M. Morris Mano, Pearson Education, 3rd edition., 2007

Additional Web Resources

3. http://www.tutorialspoint.com/computer_logical_organization/binary_codes.htm

4.http://www.tutorialspoint.com/computer_logical_organization/number_system_conversion.htm

Expected Outcomes

After completing this course, Students will be able to:

- Identify, understand and apply different number systems and codes.
- understand and appreciate Boolean algebraic expressions to digital design.
- Understand the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
- Understand the digital representation of data in a computer system.
- understand computer buses and Instruction cycle.
- depth understanding of how different hardware components are related and work in coordination.

Course Plan

Module	Topics	Hours Allotted	Remarks
I	**Number Systems and Codes:** Binary Number system – Binary to decimal –decimal to binary – hexa decimal .	3	
I	ASCII code – Excess-3 Code – Gray code. Digital Logic: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.	3	
II	**Combinatorial Logic Circuits:** Half Adder –Full Adder, Half Subtractor-Full Subtractor -Boolean Laws and Theorems. - Sum of Products method -Truth table to Karnaugh Map – Pairs, Quads, Octets –-	6	
III	**Arithmetic Circuits**: Binary Addition- Binary Subtraction – 2'S Complement Representation - 2'S Complement Arithmetic – Addition and Subtraction using 1's and 2's complement	4	
IV	**Basic Computer organization and Design**: Instruction codes - stored program organization - Computer registers and common bus system - Computer instructions	3	
IV	Timing and control - Instruction cycle: Fetch and Decode - Register reference instructions.	3	
V	**Central Processing Unit:** General register organization - stack organization – instruction formats - addressing modes - Data transfer and manipulation - Program control. CISC and RISC	4	

Course Assessment Methods

Module	Assessment Methods	Weightage	Remarks
I	**Number Systems and Codes** **Activity 1:** Number Conversion(sums) **Activity 2:** Designing Logical Gates	10	
II	**Combinatorial Logic Circuits** **Activity 1:** Design a Half Adder, Full Adder **Activity 2:** Defining Boolean Laws and Theorems. **Activity 3:** Using Karnaugh Map – Pairs, Quads, Octets.	40	
III	**Arithmetic Circuits** **Activity 1:** Binary Arithmetic Building Blocks. **Activity 2:** 2'S Complement Representation - 2'S Complement Arithmetic.	10	
IV	**Basic Computer organization and Design** **Activity 1:** Computer registers and Computer instructions **Activity 2:** Address sequencing, micro instruction format	10	
V	**Central Processing Unit** **Activity 1:** General register organization and stack organization **Activity 2:** Data transfer and manipulation **Activity 3:** Parallel processing - Pipeline- general consideration.	30	

Course Assessment Methods

Module	Assessment Methods	Weightage	Remarks
	Formative Assessment	**50 Marks**	
	Attendance (10 Marks)		
	Activity(40 marks|)		
	Summative Assessment	**50 Marks**	

	Total	100 Marks	

Grade Description

Final Result Grade Description			
% of Marks	**CGPA**	**Letter Grade**	**Result/Class Description**
90.0 - 100	9.00 – 10.00	O	Outstanding
80.0 -< 90.0	8.00 – 9.00	A+	First Class Exemplary
70.0 -< 80.0	7.00 – 8.00	A	First Class distinction

Eligibility Criteria for receiving a certificate: Student Securing 70% or above are Eligible to receive a certificate of completion.

Student Feedback and Evaluation

Link for Feedback form: https://forms.gle/135inFWnzvwsi6PA8

Certificate Copy

Students Enrolled Details

I Year BCA

Sl.No.	Reg. No.	Student Name

Digital Principles and Computer Organization

1	U19KH22S0003	ABIN SUNNY [MA]
2	U19KH22S0004	ABIN THOMAS [AE]
3	U19KH22S0005	UMME KULSUM [HI]
4	U19KH22S0006	KUSHAL N [KA]
5	U19KH22S0007	MANOJ C [KA]
6	U19KH22S0008	VINODH AM [KA]
7	U19KH22S0009	SAGAR S M [KA]
8	U19KH22S0010	NITHIYA A
9	U19KH22S0011	ALAN BOBY [MA]
10	U19KH22S0012	ASHICK ROSHAN
11	U19KH22S0013	MOHAIDEEN MUJAHITH N
12	U19KH22S0014	GANESH A
13	U19KH22S0015	RAJESH J
14	U19KH22S0016	ANUSHREE M S [KA]
15	U19KH22S0017	PRAJWAL M M [HI]
16	U19KH22S0018	ROJA S [KA]
17	U19KH22S0019	GAYANA SHREE T R [KA]
18	U19KH22S0020	THILAK S
19	U19KH22S0021	DHANUSH R
20	U19KH22S0022	DHARANI KRISHNA G
21	U19KH22S0023	SHESHADHRI N
22	U19KH22S0024	KIRAN G [KA]
23	U19KH22S0025	SUDEEP M
24	U19KH22S0026	AMISHA NAYANA GOWDA [KA]
25	U19KH22S0027	RANJITHA PU [KA]
26	U19KH22S0028	SUMEET DEWASI [HI]
27	U19KH22S0029	SATHVIKA S [KA]
28	U19KH22S0030	NITESH GUPTA U [HI]
29	U19KH22S0031	SANTHOSH U
30	U19KH22S0032	GANESH KUMAR B
31	U19KH22S0033	RANJITH V [KA]
32	U19KH22S0034	VINAY KUMAR M [KA]

33	U19KH22S0035	MITHUN P [AE]
34	U19KH22S0036	PAVAN B
35	U19KH22S0037	SURIYA R
36	U19KH22S0038	DHANUSH D
37	U19KH22S0063	CHAITHRA M
38	U19KH22S0064	YUVARAJ RS
39	U19KH22S0065	ANUSHA M [HI]
40	U19KH22S0066	THEJUS KRISHNA KV [MA]
41	U19KH22S0067	RANJITH KUMAR S
42	U19KH22S0069	SRI PRADHA S K [KA]
43	U19KH22S0070	NIROSHA G
44	U19KH22S0071	TEJESH A
45	U19KH22S0072	CHANDANI MAURYA D [AE]
46	U19KH22S0073	BOOMIKA B
47	U19KH22S0074	JANAVI S
48	U19KH22S0075	BRITHI S [HI]
49	U19KH22S0076	F ZAINAB HANEEN [HI]
50	U19KH22S0077	ROHIT KUMAR D [HI]
51	U19KH22S0078	ARUNTHATHI N
52	U19KH22S0094	SHIRISHA M [HI]
53	U19KH22S0096	ZOHA S [HI]
54	U19KH22S0099	ASWINI K
55	U19KH22S0100	SHAMIMAA S
56	U19KH22S0101	SANTHOSH KUMAR DU
57	U19KH22S0102	KIRAN L [AE]
58	U19KH22S0103	RAKSHITHA NM [KA]
59	U19KH22S0110	KIRAN C
60	U19KH22S0111	AAKARSH J SINGH [KA]
61	U19KH22S0112	SRIVASTHSAV G [AE]
62	U19KH22S0113	SAHANA M [KA]
63	U19KH22S0114	JAYA PRAKASH NARAYANA B [AE]
64	U19KH22S0116	PRAJWALSINGH S [AE]
65	U19KH22S0119	LLOYD ANGELO JENKINS