About RCASC

Dr. M S Ramaiah, a visionary and philanthropist established "Gokul Education Foundation (GEF)", in the year 1962, to deliver education an healthcare for the betterment of mankind. Under the tutelage of GE Ramaiah college of Arts, Science and Commerce (RCASC) was established i 1994. RCASC is Re-accredited with "A" Grade by NAAC, permanentl affiliated to Bangalore University (BU) and Bengaluru Central Universit and approved by AICTE.

About Department

The department was conventional in the year 2008, now offering under graduate course BSc in Electronics. The has well established spacious laboratories with advanced Electronic calibration systems with qualified faculties to provide good lab facility. The course syllabus followed BOS Electronics prescribed by the Bengaluru City University. The Additional Value Added course is engaged in every year to prepare individuals who are technically sound and capable of fitting into the modern IT and Electronics environment in the present industry scenario.

Aim of VAC

The aim of our Institution is to attain sustainable development ir enhancing the academic and intellectual environment by providing ample opportunity to involve in innovative learning, driving up the institutiona ranking and increases the quality of learning. Research in Electronics discipline of thought is an ongoing process of enhancing the survival skills amongst students by exploring new frontiers that challenge the Digita system for understanding reality. More over digitalization in transactions communications and application mandate every one need to turn back anc learn Digital fundamentals. Hence Department has taken initiative tc improve the digital skills in our students in implementation level.

RAMAIAH
College of Arts, Science & Commerce

ಎಮ್ ಎಸ್ ರಾಮಯ್ಯ ಕಲಾ, ವಿಜ್ಞಾನ ಮತ್ತು ವಾಣಿಜ್ಯ ಕಾಲೇಜು
M S Ramaiah College of Arts, Science and Commerce
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Ranked 62nd in NIRF India Ranking by MHRD, New Delhi
DBT Star College Scheme

Value Added Course
on
"Digital System Fundamentals"

16th October to 12th February - 2022

Organized by:

Department of Electronics

M S Ramaiah college of Arts, Science and Commerce, Bangalore - 560054

Msrcasc elec@gmail.com

Course Outline

Sl. No.	Contents	Duration
1	Module 1 Lecture: Introduction to Digital Systems and Number Systems Distinction	8 hrs
2	Module 2: Lecture: Information coding and Parity	4 hrs
3	Module 3 Lecture: Logic Gates and Families	8 hrs
4	Module 4: Hands on Training with basic experiments	10 hrs

Objective

- To make the students know about the fundamental principles of digital electronics and familiarization with the available IC chips.
- To give the students background in the broad field of digital systems design and microprocessors.
- To transport information on the right way to transform the strength of the students' knowledge into scalable outcomes through perfect understanding of the requirements of courses in post-graduation and research in Electronics field in future.
- To provide hands on training to enhance the skills of students in Digital Systems and Fundamentals.

Outcome

- To enhance the knowledge of students in digital electronics and digital systems design and microprocessors.

Course Coordinator:

Dr. Naveen Kumar. R.
Assistant Professor,
Dept. of Electronics,
MSRCASC

For Registration, please send request to mail ID [redacted], on or before 10th October 2021

There is no Registration fee

Patrons

Sri.M.R.Janakiram
(Hon'ble Director, GEF)

Sri.M.R.Kodandaram
(Hon'ble Director, GEF)

Sri.B. S. Ramaprasad
(Chief Executive, Gen Sc, GEF)

Sri.G.Ramachandra
(Chief of Finance, E &Gen Sc., GEF)

Dr.Nagarathna.A
Principal, MSRCASC

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Ref No: MSRCASC/ELE/2021-22/001 **Dated: 11/10/2021**

CIRCULAR

Department of Electronics

Department of Electronics is organizing a **Value Added Course on "Digital Systems fundamentals"** from 16/10/2021 to 12/02/2022 for II year B.Sc. (EMCs) students. Interested students are to enrol to Dr. Naveen Kumar R.

HOD 11/10/21
HEAD OF THE DEPARTMENT
Department of Electronics
M. S. Ramaiah College of
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M.S.R. Nagar, Bangalore-560 054.

Principal
Principal,
M.S. Ramaiah College of Arts, Science & Commerce
MSRIT Post, MSR Nagar
Bangalore - 560 054

Report on "Value Added Course of "Digital Systems Fundamentals"

(from 16th October 2021 to 12th February 2022):

Objectives:

- To make the students know about the fundamental principles of digital electronics and familiarization with the available IC chips.
- To give the students background in the broad field of digital systems design and microprocessors.
- To transport information on the right way to transform the strength of the students' knowledge into scalable outcomes through perfect understanding of the requirements of courses in post-graduation and research in Electronics field in future.
- To provide hands on training to enhance the skills of students in Digital Systems and Fundamentals.

Digital systems are designed to store, process, and communicate information in digital form. They are found in a wide range of applications, including process control, communication systems, digital instruments, and consumer products. This course gives the students a complete insight into the modern design of digital systems fundamentals from an eminently practical point of view. Unlike other more "classic" digital circuits courses, this course focuses more on the system than on the electronics that support it. This approach will help for the students to lay the foundation for the design of complex digital systems. This course develops engineering capabilities pertaining to the design of digital electronic systems. The course is also targeted in providing practical exposure to students in digital systems.

The department of Electronics conducted the Value added Course on "**Digital Systems fundamentals**" for II B.Sc. (Electronics) students from 16th October 2021.

Dr. Naveen Kumar R is interested to take responsibility as an in charge of this course and time tables were framed in the value added hour period on Saturdays.

- Course Delivered in October Month: Initiated the module 1 lecture along with basic concepts of digital electronic equipment's. Significance of the digital circuits, how for the digital circuits related with the human life. Meaning of digital circuits. How digital circuits process the data. The number system used in the digital circuits. Differentiation between analog signals and digital signals.The binary number system. Octal number system, Hexadecimal number system and their interconversions. Arithmetic operations on binary number system like binary addition, binary subtractions, binary division and binary multiplications to process the data. The special binary data processing which includes 1's and 2's complement of binary number.

- Course Delivered during November: Initiated the module 2 lecture along with the digital circuits are designed in such a way that to handle different codes namely weighted codes and non-weighted codes. BCD, excess-3 and Gray code. Concept of parity, single and double parity and error detection and correction (Hamming code) Alpha numeric codes: ASCII, EBCDIC and Unicode are explained with an example for example our keyboard of computer uses ASCII code to handle the data
- Course Delivered during December: Initiated the module 3 lecture along with the concept of pulse with positive and negative logic. Pulse characters' like positive edge, negative edge, ON state and OFF state representation in pulse. In this week we covered the basic building blocks of the digital circuits like basic and universal gates along with the special gates namely XOR and XNOR gates. The different logic families like TTL and CMOS logic.
- Course Delivered during January: Initiated the module 4 lecture along with basic idea of digital trainer kits in order to verify the truth table of logic gates which helps the students to understand the working of digital gates by using digital integrated circuits(ICs). The universal property of NAND and NOR gate is also verified. In this module we constructed the simple combinational circuits like adder, subtract or and operations of these circuits also verified by using the truth table.
- Course revision and Test on February: The revision of whole concept was revised and test was conducted for students to assess their learning outcome and progression.

Outcomes:

- It enhanced the knowledge of students in the fundamentals of Digital Systems and IC trainer kits.
- Given hands on training using Digital IC trainer kits and its applications will be helpful for the students to build small Electronic projects and further research in VHDL.

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Bangalore - 560 054

Course Content

The course was conducted for the duration of 30 hours in four different modules:

- **Module 1: Introduction to Digital Systems and Number Systems (08 hrs)**

  Distinction between analog and digital signal, Applications and advantages of digital signals. Documentation Standards for digital Systems.

  Number System: a) Binary, octal and hexadecimal number system: conversion from decimal and hexadecimal to binary and vice-versa. b) Binary addition, subtraction, multiplication and division including binary points. Sign magnitude method of representation, 1's and 2's complement method of addition/subtraction, floating point representation

- **Module 2: Codes and Parity (04 hrs)**

  Concept of code, weighted and non-weighted codes, examples of BCD, excess-3 and Gray code. Concept of parity, single and double parity and error detection and correction (Hamming code) Alpha numeric codes: ASCII, EBCDIC and Unicode.

- **Module 3: Logic Gates and Families(08hrs)**

  Concept of negative and positive logic, Definition, symbols and truth tables of gates. Construction of NOT, AND and OR gates from NAND and NOR gates (universal gates). Introduction to TTL and CMOS logic families and their sub classification

- **Module 4: Lab Experiments (10 hrs)**

The necessary training is given to implement the following experiments-:

a. Familiarization of digital trainer kit.
b. Verification and interpretation of truth tables for AND, OR, NOT NAND, NOR and Exclusive OR (EXOR) and Exclusive NOR(EXNOR) gates
c. Realization of logic functions with the help of NAND or NOR gates - Design of a NOR gate latch and verification of its operation
d. To design 4-bit adder, 2's complement subtractor circuit using a 4-bit adder IC and an XOR IC and verify the operation of the circuit.

Assessment Test: VAC "Digital Systems Fundamentals"

Total: 20M

Answer all the questions each question carries ONE mark

1. write the symbol of AND gate
2. list the universal gate
3. Define analog signal
4. Name the gate which produce the complement of the input
5. Write the truth table of XOR gate.
6. Write the IC number for OR gate
7. Convert decimal number 22 into binary number.
8. Calculate 2's complement of the binary number 1101
9. Write the binary equivalent of $(AC)_{16}$
10. Calculate 1101+1000
11. Write the octal equivalent of 110111
12. What is ALU?
13. List the logical operations in digital electronics
14. If two inputs are logic zero in NAND gate then write the output state.
15. Write the IC number for NOT gate
16. Calculate 1110-0001 using 2's complement
17. List any two applications of logic gates
18. Name the IC number for AND gate
19. Name the gate given below

20. Write the truth table for XNOR gate

VAC Assessment

SL. NO.	Reg. No.	Students Name	Atten dance(5)	Asgn. (15)	Test(20)	Total (40)	Signature
1	S2014618	AKHILESH K	5	15	20	40	
2	S2014619	AKSHAY KUMAR D R	5	15	20	40	
3	S2014622	DEEPA G	5	15	20	40	
4	S2014623	DEEPAK M	5	15	20	40	
5	S2014624	DEEPTHI REDDY A R	5	15	17	37	
6	S2014625	DISHA HEGDE	5	15	20	40	
7	S2014626	GOVARDHAN B R	5	15	20	20	
8	S2014627	GREESHMA K JOSHI	5	15	20	40	
9	S2014628	HARIHARAN N S	5	15	20	40	
10	S201462[illegible]	[illegible]INDRA D	5	15	20	40	
11	S20146130	KAMMARI SREEHARI	4	15	18	37	
12	S201463[illegible]	KOUSHIK.S	5	15	20	40	
13	S201462[illegible]	M.YATHISH	5	15	20	40	
14	S2014636	NISARGA H S	5	15	20	40	
15	S2014637	NISHA A N	5	15	20	40	
16	S2014639	PAVITHRA N	5	15	20	40	Pavitra
17	S2014643	RUCHITHA V	5	15	20	40	
18	S2014645	SANTHOSH YADHAV N	5	15	20	40	Santhosh YADAV
19	S2014650	V LAKSHMI	5	15	15	35	
20	S2014652	VARSHA YADAV	5	15	20	40	
21	S2014656	YESHWANTH C R	5	15	20	40	

HOD

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M.S.R. Nagar, Bangalore-560 054.

Principal

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M.S. Ramaiah College of Arts, Science & Commerce
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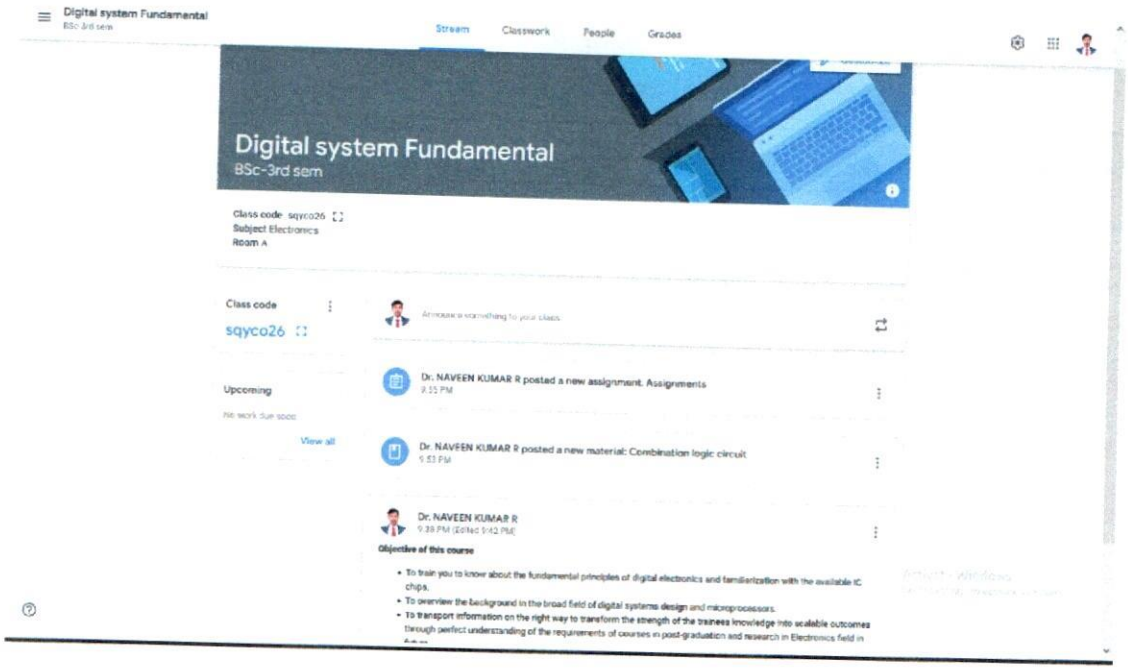
Bangalore - 560 054

Digital class room screenshot of web page



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Department of Electronics

Attendance of Value-Added program on Digital Systems Fundamentals 2021-22

SL. NO.	Reg. No.	Students Name	16/ 10	16/ 10	23/ 10	23/ 10	30/ 10	11/ 11	13/ 11	13/ 11	20/ 11	20/ 11	27/ 11	2/ 12	4/ 12	4/ 12	9/ 12	16/ 12
1	S2014618	AKHILESH K	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	S2014619	AKSHAY KUMAR D R	0	0	1	2	3	3	4	5	6	7	8	9	10	11	12	13
3	S2014622	DEEPA G	0	1	2	3	4	4	5	6	7	8	9	10	11	12	13	14
4	S2014623	DEEPAK M	0	1	2	3	3	3	4	5	6	7	8	9	10	11	12	13
5	S2014624	DEEPTHI REDDY A R	0	1	2	3	4	5	6	7	7	8	9	10	11	11	12	13
6	S2014625	DISHA HEGDE	1	2	3	4	5	6	6	7	8	8	9	10	11	12	13	13
7	S2014626	GOVARDHAN B R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
8	S2014627	GREESHMA K JOSHI	1	2	3	4	5	6	7	8	9	10	11	12	13	13	14	15
9	S2014628	HARIHARAN N S	1	2	2	3	3	4	4	5	6	7	8	9	10	11	12	13
10	S2014622	INDRA D	1	2	3	4	5	6	7	7	8	9	10	10	11	12	13	14
11	S2014623	KAMMARI SREE HARI	1	1	2	3	3	4	5	6	7	8	9	10	11	12	13	14
12	S2014624	KOUSHIK S	0	0	0	0	1	2	3	4	5	6	7	8	9	10	11	12

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13	S2014625	M YATHISH	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14
14	S2014636	NISARGA H S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
15	S2014637	NISHA A N	0	1	2	3	4	5	6	7	7	8	8	9	9	10	11	12
16	S2014639	PAVITHRA N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	S2014643	RUCHITHA V	1	2	3	3	4	5	6	7	8	9	10	11	11	12	13	14
18	S2014645	SANTHOSH YADHAV N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
19	S2014650	V LAKSHMI	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
20	S2014652	VARSHA YADAV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
21	S2014656	YESHWANTH C R	1	2	3	4	5	6	6	7	8	8	9	10	11	12	13	14

Course coordinator

HOD

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Department of Electronics

Attendance of Add On course on Value-Added program on Digital Systems Fundamentals 2021-22

SL. NO.	Reg. No.	Students Name	18/12	23/12	30/12	1/1	1/1	6/1	20/1	22/1	27/1	29/1	3/2	10/2	08/2	12/02	Total
1	S2014618	AKHILESH K	16	17	18	19	20	21	22	23	24	25	26	27	28	29	29
2	S2014619	AKSHAY KUMAR D R	14	15	16	17	18	19	20	21	22	23	24	25	26	27	27
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5	S2014624	DEEPTHI REDDY A R	13	14	15	15	16	16	17	18	19	20	21	22	23	24	24
6	S2014625	DISHA HEGDE	17	18	19	20	21	22	23	24	25	26	27	28	29	30	30
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11	S2014630	KAMMARI SRIHARI	15	16	17	18	19	20	21	22	23	24	25	26	27	28	28
12	S2014631	KOUSHIK S	13	14	15	16	17	18	19	20	21	22	23	24	25	26	26

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16	S2014639	PAVITHRA N	16	17	18	19	20	20	21	22	23	24	25	26	27	28	28
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Course coordinator

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CERTIFICATE

Department of Electronics

This is to certify that _____ , _____ from _____ has Participated in Value Added Course on **"Digital Systems fundamentals"** from 16/10/2021 to 12/02/2022 organized by **Department of Electronics(under DBT Star college scheme), M S Ramaiah College of Arts, Science and Commerce, Bengaluru -54.**

Dr. Naveen Kumar R
Program Coordinator

Dr. Prathiba V K
HOD, Dept. of Electronics

Dr. A. Nagarathna
Principal
(RCASC)