



**RAMAIAH**  
College of Arts, Science  
& Commerce

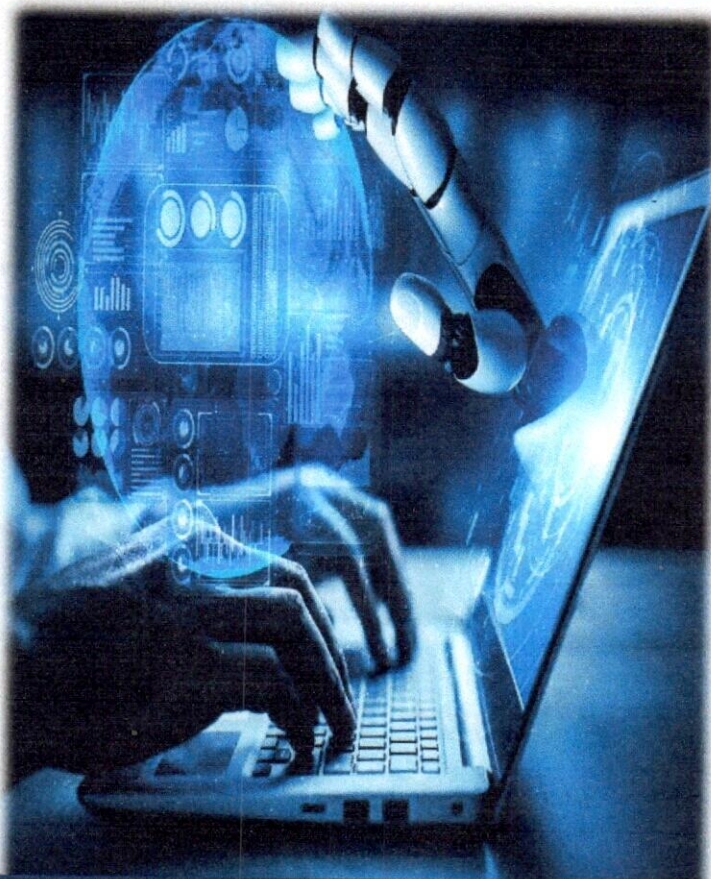
## Department of Electronics

**Organizes**

*Value Added Course on*

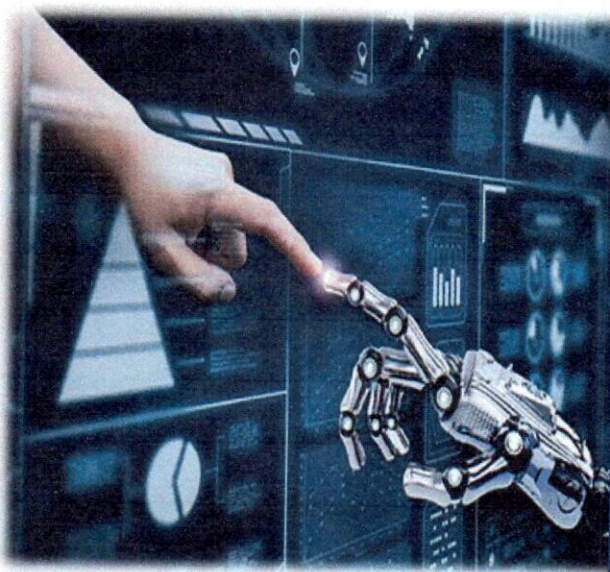
# Introduction to Robotics Systems and its Applications

**From 28<sup>th</sup> April to 28<sup>th</sup> May 2022**



### Objectives

- To make the students know about the familiarize with the facts behind Robotics
- To give the students background in the broad field of Robotics, Arduino
- Machine Vision and Artificial Intelligence
- To transport information on the right way to transform the strength of the students' knowledge into scalable outcomes through project demonstrations and familiarization of Robo analyzer software.
- To provide hands on training to enhance the skills of students and to bring up with innovative ideas in Robotics.



### Expected Outcomes

- To enhance the knowledge of students in Robotics, Machine Vision and Artificial Intelligence
- Given hands on training using Robo analyser software and project demonstrations and will be helpful for the students to build small Electronic projects and further research in Robotics.

### Course Coordinator:

**Mrs Rithu R**, Assistant Professor, Dept. of Electronics, MSRCASC



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DBT Star College Scheme

**Ref No: MSRCASC/ELE\_VAC/2021-22/03****Dated:11/04/2022****CIRCULAR****Department of Electronics**

Department of Electronics is organizing a **Value Added Course on "Robotics and its Applications"** from 28/04/2022 to 28/05/2022 for III year B.Sc. (EMCs) students and 2<sup>nd</sup> year BCA Students. Interested students are to enroll by paying Rs.100/- to Mrs Rithu R, Electronics Department and need to register in the link provided below:-

Registration Link:

[https://docs.google.com/forms/d/e/1FAIpQLSeM f dvTT9ohqfDBf4B 8q0BILufDRfJxzuAnouqUN1xaUqA/viewform?usp=pp\\_url](https://docs.google.com/forms/d/e/1FAIpQLSeM f dvTT9ohqfDBf4B 8q0BILufDRfJxzuAnouqUN1xaUqA/viewform?usp=pp_url)

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**Department of Electronics**  
**M. S. Ramaiah College of**  
**Arts, Science & Commerce**  
**M.S.R. Nagar, Bangalore-560 054.**

**Principal**

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

## Schedule

SL. NO.	Contents	Duration
1.	<b>Module 1 Lectures:</b> <b>ROBOT BASICS --:</b> Definition of Robot & Robotics, Basic concepts, Need, Law of Robotics, History, Parts of Robots, applications, types of Robots, advanced robots, future of Robotics, Advantages and Disadvantages.	8 hrs
2.	<b>Module 2: Lectures:</b> <b>ROBOTICS SENSORS --:</b> Sensors in robot – Touch Sensors- Tactile sensor – Proximity and range sensors. Force Sensor-Light sensors, Pressure sensors, Introduction to Machine Vision and Artificial Intelligence.	8 hrs
3.	<b>Module 3 Lectures</b> <b>AURDINO UNO--:</b> AURDINO UNO- introduction, pindigram, components, Aurdino based obstacle avoiding Robot-Block diagram, components, Explanation, principle, working and Block diagram of Line Follower Robot.	8 hrs
4.	<b>Module 4:</b> <b>Demonstration Experiments--:</b> a. Familiarization of Robo analyzer 3D based Robotics software b. Familiarization of INDUSTRIAL ROBOTS c. Forward Kinematics d. Inverse kinematics e. Demonstration of Robotic Projects	8 hrs

### Who can attend the course?

The Course is open for all streams of BSc students, BCA students & Faculties from our institution and students from other institutions.

#### Registration Link:

[https://docs.google.com/forms/d/e/1FAIpQLSeM f dvTT9ohqfDBf4B8q0BILufDRfjxzuAnouqUN1xaUqA/viewform?usp=pp\\_url](https://docs.google.com/forms/d/e/1FAIpQLSeM f dvTT9ohqfDBf4B8q0BILufDRfjxzuAnouqUN1xaUqA/viewform?usp=pp_url)

#### For further details, Contact:

Mrs Rithu.R

Email: [rithu19@gmail.com](mailto:rithu19@gmail.com)

Phone: +91-9886807795



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**Report on "Value Added Course on "Robotics and its Applications"****(from 28<sup>th</sup> April 2022 to 28<sup>th</sup> May 2022):****Objectives:**

- To make the students know about the familiarize with the facts behind Robotics
- To give the students background in the broad field of Robotics, Machine Vision and Artificial Intelligence
- To transport information on the right way to transform the strength of the students' knowledge into scalable outcomes through project demonstrations and familiarization of Roboanalyzer software
- To provide hands on training to enhance the skills of students in Robotics.

21<sup>st</sup> century is an era of rapid technology development that had seen tremendous advancements and new emerging technologies in telecommunication, mobile technology, robotics, IC technology and space explorations. Robotics technology is evolved as a more prominent among these and often twinned with Artificial Intelligence and Process Automation.

The Robotics Process Automation (RPA) became emerged as one of the top most advanced technology in software industry and there is a huge demand for RPA professionals in IT sector. Mobile Robots fueled up the era of startup companies developing service Robots as waiters in restaurants, for monitoring patients in hospitals during Covid pandemic and even cooking Robots are evolved.

Robotics even intruded to our day to day as amazon Alexa replying to our queries, playing music and stories for us, switching lights and as automatic machine sweeper and as automatic car and toys for child to play with. Humanoid, industrial, surveillance robots and drones became an integral part in medical, agricultural, industrial, security, commercial, consumer, defence and military fields to replace the humans, to ease their repetitive works with at most accuracy and as a source of entertainment.

The department of Electronics conducted the Value added Course on "Robotics and its Applications" for III year B.Sc. (Electronics) students and II year BCA Students from 28<sup>th</sup> April 2022. The course was conducted for the duration of 30 hours in four different modules.

Mrs Rithu R is interested to take responsibility as an in charge of this course during student's vacation time from 28/04/2022 to 14/05/2022 and from 16/05/22 time tables were

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framed in the value added hour period on Thursdays and Saturdays.

Week 1: The students were introduced to the concepts of robotics such as definition of robotics, how its name emerged, types of robots, terminologies associated with Robotics, Current technologies, advanced robots, advantages, disadvantages, applications and future of robotics. The students were shown keen interest on this course and had shown them some videos on different robots such as humanoid robots, ant robots, dragon fly, butterfly robots, wheeled robots, snake robots and quadruple robots.

Week 2: It was mainly focused on the different components of Robots. The students were given in depth knowledge on different kind of sensors used in industrial and humanoid robots for different application like manipulation tasks, arc welding, painting, assembling, packaging and batch processing. The students were introduced to the concepts of Machine learning and Artificial Intelligence.

Week 3: The students got familiarized with the controller AURDINO UNO, its PIN diagram, specifications and how to program the AURDINO UNO. The students were given hands on experiments on two projects obstacle avoiding robot and white line follower robot and learnt the principle, working and how to program AURDINO for these two projects.

Week 4: The Students were introduced to the Roboanalyzer 3D based Robotics software and got familiarized with some of the industrial robots like PUMA and concept of Degree of freedom(DoF), forward and inverse kinematoics using that software and some of the robotic projects were demonstrated.

#### Outcomes:

- It enhanced the knowledge of students in the fundamentals of Robotic Systems, components, different terminologies, its types and applications in various domains.
- The students learnt how to develop and program a robot to deploy it for a particular application by demonstrating some simple Robotic Projects.

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Principal

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## Course Content

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

➤ **Module 1: ROBOT BASICS (08 hrs)**

Definition of Robot & Robotics, Basic concepts, Need, Law of Robotics, History, Parts of Robots, applications, types of Robots, advanced robots, future of Robotics, Advantages and Disadvantages.

➤ **Module 2: ROBOTICS SENSORS (08hrs)**

Sensors in robot – Touch Sensors- Tactile sensor – Proximity and range sensors. Force Sensor-Light sensors, Pressure sensors, Actuators-different types, principle of working of dc motor and stepper motor. Introduction to Machine learning and Artificial Intelligence

➤ **Module 3: AURDINO UNO(06hrs)**

AURDINO UNO- introduction, pindigram, components,Aurdino based obstacle avoiding Robot-Block diagram,components,Explanation, principle,working and Block diagram of Line Follower Robot.

➤ **Module 4: Demonstration Experiments (08 hrs)**

- Familiarization of Roboanalyzer 3D based Robotics software
- Familiarization of INDUSTRIAL ROBOTS
- Forward Kinematics
- Inverse kinematics
- Demonstration of Robotic Projects





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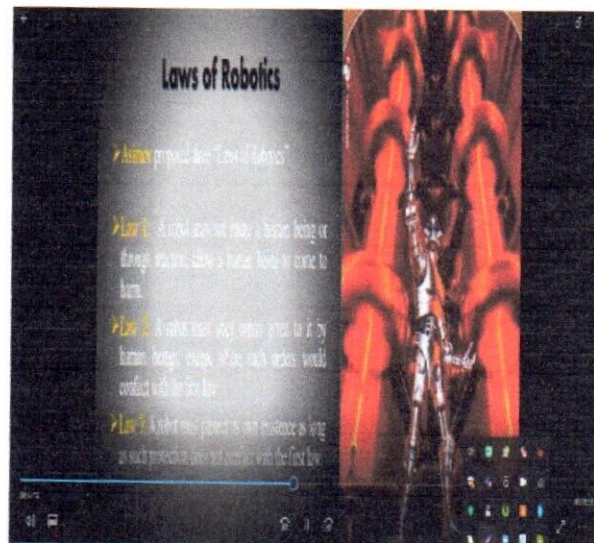
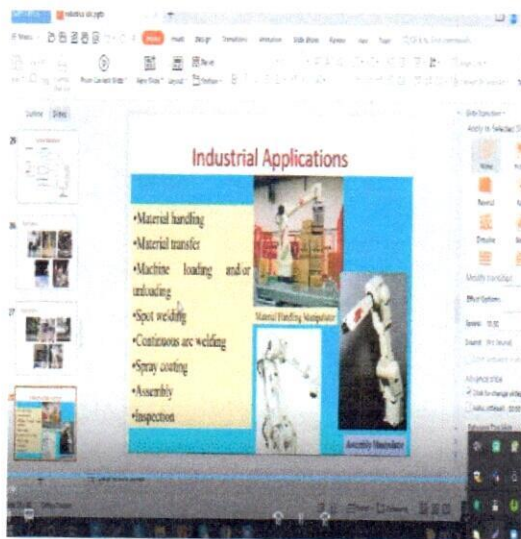
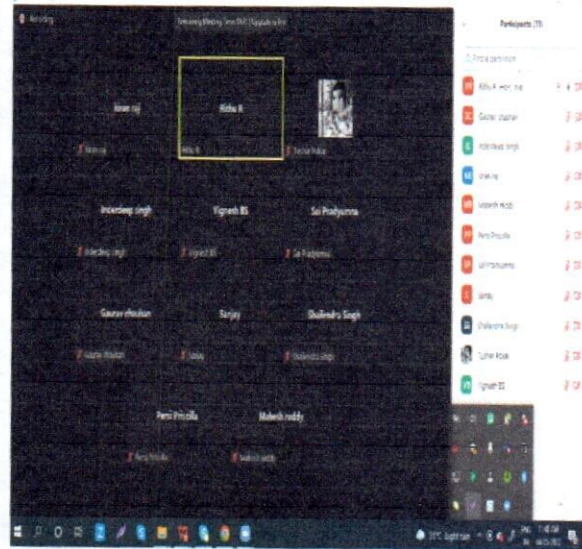
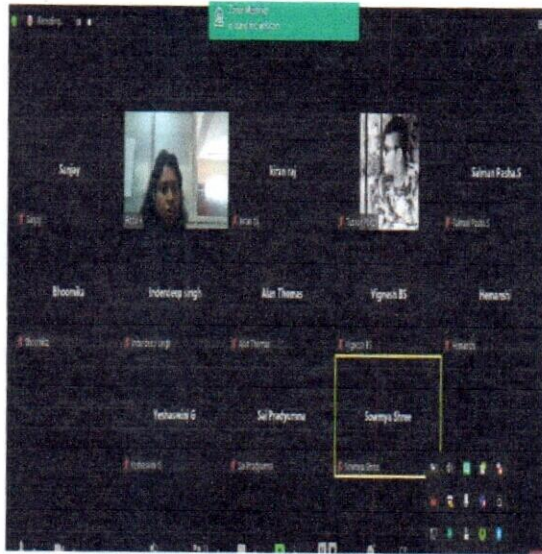
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## Department of Electronics

### Photos of VAC on "Robotics and its Applications"



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Principal

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**Assessment Test: VAC "Digital Systems Fundamentals"**

**Total: 20 marks**

1. An example of an actuator which tends the robot to do the joint movements is

1 mark

Options

- a. dc motor
- b. RTD
- c. sensor
- d. None of the above

2. Which of the following is not functionality of robotics?

1 mark

Options

- a. Re-programmability
- b. Multi-functionality
- c. Efficient performance
- d. Responsibility

3. A device that is used to detect event or changes in the environment is called

1 mark

Options

- a. Sensor
- b. Middleware
- c. Actuator
- d. Transducer

4. Which of the following is not advantage of robotics?

1 mark

Options

- a. Greater flexibility and re-programmability
- b. Greater response time to inputs than human
- c. Greater unemployment
- d. Improved product quality

5. Which of the basic parts of a robot unit would include the computer circuitry that could be programmed to determine what the robot would do?

1 mark

Options

- a. Sensor
- b. Controller
- c. Arm
- d. End Effector



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6. The first Industrial Robot is

1 mark

Options

- a. Rabot
- b. Unimate
- c. Rebot
- d. PUMA

7. Who proposed the three laws of Robotics?

1 mark

Options

- a. Asimov
- b. Karel Capk
- c. John Bardeen
- d. None of the above

8. List the different types of Robots

2 marks

9. HRP-4 is a .....

1 mark

Options

- a. Snake Robot
- b. Drone
- c. Humanoid Robot
- d. Quadrupler

10. Which among the following is a military Robot?

1 mark

Options

- a. Predator
- b. Nao
- c. Asimo
- d. None of the above

11. State the three laws of Robotics

6 marks

12. Aurdino UNO can act as ----- in obstacle avoiding robot

1 mark

Options

- a. Sensor
- b. Controller
- c. Transducer
- d. None of the above



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13. In obstacle avoiding Robot sensor used is

1 mark

Options

- a. Ultraviolet Sensor
- b. Temperature Sensor
- c. Humidity Sensor
- d. None of the above

14. -----in industrial robots perform the tasks or manipulations just like our fingers.

1 mark

Options

- a. Sensor
- b. Arms
- c. Transducer
- d. End Effector



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**VAC Assessment**

SL. NO.	Reg. No.	Students Name	Course	S e m	Atd . (5)	Asgn . (15)	Test (20)	Tot al (40)	Signature
1.	R2017635	Nagendra.N	BCA	4	5	15	13	33	Nagendra
2.	R2017678	Vinutha YN	BCA	4	5	15	19	39	Vinutha
3.	R2017676	Vikrant Vir	BCA	4	5	15	20	40	Vikrant
4.	R2017609	Anusha Balasubramani	BCA	4	5	15	18	38	Anusha
5.	R2017661	Sheela. B	BCA	4	5	15	20	40	Sheela
6.	R2017633	Monazir khan	BCA	4	5	15	20	40	Monazir Khan
7.	R2017674	Vignesh BS	BCA	4	5	15	20	40	Vignesh
8.	R2017651	Roshni M	BCA	4	5	15	19	39	Roshni
9.	S1914644	Sai Pradyumna	BSc(EMCs)	6	5	15	20	40	Sai
10.	R2017680	Yeshaswini G	BCA	4	5	15	19	39	Yeshaswini
11.	2017R628	Kiran raj	BCA	4	4	15	20	39	Kiran
12.	R2017653	Sadhana S	BCA	4	5	15	20	40	Sadhana
13.	R2017664	Sonia sarah	Bca	4	5	15	19	39	Sonia
14.	R2017605	Akash s	BCA	4	5	15	18	38	Akash
15.	R2017632	Mohammed sahil	BCA	4	5	15	20	40	Mohammed
16.	R2017638	P. Persi Priscilla	BCA	4	5	15	20	40	P. Persi
17.	R2017677	Vindhya V R	BCA	4	5	15	18	38	Vindhya
18.	R2017668	Supriya GR	BCA	4	5	15	14	34	Supriya
19.	R2017672	Tushar Pokar	BCA	4	5	15	20	40	Tushar
20.	R2017626	Jason Martin Dsouza	BCA	4	5	15	20	40	Jason
21.	20BCA52	Rushabh Mohan bhor	BCA	4	5	15	20	40	Rushabh
22.	R2017665	SOWMYA SHREE G.S	BCA	4	5	15	20	40	Sowmya
23.	R2017611	B. S. Anshu	BCA	4	5	15	19	39	Anshu
24.	R2017606	Alok N	BCA	4	5	15	20	40	Alok
25.	R2017640	Pooja R	BCA	4	5	15	19	39	Pooja
26.	R2017645	RAHUL C	BCA	4	5	15	19	39	Rahul
27.	R2017614	Bhumika Padaliya	BCA	4	5	15	20	40	Bhumika
28.	R2017657	Sandeep Kumar M	BCA	4	4	15	19	39	Sandeep
29.	R2017607	Aman Barik	BCA	4	5	15	20	40	Aman
30.	R2017636	Naveen E	Bca	4	5	15	20	40	Naveen
31.	R2017620	Gorantla Yeshaswini	BCA	4	5	15	19	39	Yeshaswini
32.	S1914635	Mohammed Ryhan Khan	BSc(EMCs)	6	5	15	19	39	Mohammed
33.	S1914617	Aman Kaushal	BSc(EMCs)	6	5	15	20	40	Aman
34.	S1914640	Mahesh Reddy P	BSc(EMCs)	6	5	15	20	40	Mahesh
35.	S1914645	Sayantana Pal	BSc(EMCs)	6	5	15	20	40	Sayantana
36.	S1914624	Chetan G	BSc(EMCs)	6	5	15	20	40	Chetan



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37.	S1914628	Sainath Reddy	BSc(EMCs)	6	5	15	20	40	<i>Sainath</i>
38.	S1914641	Prashanth	BSc(EMCs)	6	5	15	20	40	<i>Prashu</i>
39.	S1914623	Charan P	BSc(EMCs)	6	5	15	19	39	<i>Charan</i>
40.	S1914631	Jibin K Job	BSc(EMCs)	6	5	15	20	40	<i>K Job</i>
41.	S1914616	Alan Thomas	BSc(EMCs)	6	5	15	19	39	<i>Alan</i>
42.	S1914625	Dhananjay	BSc(EMCs)	6	5	15	19	39	<i>Dhanat</i>
43.	S1914626	Dushyanth Tejas	BSc(EMCs)	6	5	15	13	33	<i>Tejas</i>
44.	S1914651	Yashwanth	BSc(EMCs)	6	5	15	19	39	<i>Yash</i>
45.	S1914648	Shraddha	BSc(EMCs)	6	4	15	20	40	<i>Shraddha</i>
46.	S1914632	Karthik M Acharya	BSc(EMCs)	6	5	15	18	38	<i>Acharya</i>
47.	S1914629	Harshitha B C	BSc(EMCs)	6	5	15	20	40	<i>Harshitha</i>

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DBT Star College Scheme

**Department of Electronics****Attendance of Value-Added program on Robotics Systems and its Applications 2021-22**

SL. NO.	Reg. No.	Students Name	06/05	07/05	07/05	07/05	13/05	13/05	14/05	14/05	14/05	19/05	21/05	21/05	26/05	28/05	28/05
1.	R2017635	Nagendra.N	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2.	R2017678	Vinutha YN	16	16	17	18	19	20	21	22	23	24	25	26	27	28	29
3.	R2017676	Vikrant Vir	16	17	18	19	19	20	21	22	23	24	25	26	27	28	29
4.	R2017609	Anusha Balasubramani	15	16	17	18	18	19	20	21	22	23	24	25	26	27	28
5.	R2017661	Sheela. B	15	15	16	17	18	19	20	21	22	23	24	25	26	27	28
6.	R2017633	Monazir khan	15	16	17	18	19	20	21	22	23	23	24	25	26	27	28
7.	R2017674	Vignesh BS	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
8.	R2017651	Roshni M	14	15	16	17	18	19	19	20	21	22	23	24	25	26	27
9.	S1914644	Sai Pradyumna	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
10.	R2017680	Yeshaswini G	16	17	18	19	20	21	21	22	23	24	25	26	27	28	29
11.	2017R628	Kiran raj	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
12.	R2017653	Sadhana S	16	17	18	19	20	21	22	22	23	24	25	26	27	28	29
13.	R2017664	Sonia sarah	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
14.	R2017605	Akash s	16	16	17	18	19	20	20	21	22	23	24	25	26	27	28
15.	R2017632	Mohammed sahil	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
16.	R2017638	P. Persi Priscilla	15	16	17	18	18	19	20	21	22	23	24	25	26	27	28
17.	R2017677	Vindhya V R	14	15	16	17	18	19	20	20	21	22	23	24	25	26	27
18.	R2017668	Supriya GR	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
19.	R2017672	Tushar Pokar	16	17	18	18	19	20	21	22	23	24	25	26	27	28	29

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20.	R2017626	Jason Martin Dsouza	16	17	17	18	19	20	21	22	23	24	25	26	27	28	29
21.	20BCA52	Rushabh Mohan bhor	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
22.	R2017665	SOWMYA SHREE G.S	15	16	17	18	19	20	21	22	23	24	25	26	27	27	28
23.	R2017611	B. S. Anshu	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
24.	R2017606	Alok N	16	17	18	19	20	20	21	22	23	24	25	26	27	28	29
25.	R2017640	Pooja R	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
26.	R2017645	RAHUL C	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
27.	R2017614	Bhumika Padaliya	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
28.	R2017657	Sandeep Kumar M	14	15	15	16	17	18	19	20	21	22	23	24	25	26	27
29.	R2017607	Aman Barik	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
30.	R2017636	Naveen E	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
31.	R2017620	Gorantla Yeshaswini	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
32.	S1914635	Mohammed Ryhan Khan	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
33.	S1914617	Aman Kaushal	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
34.	S1914640	Mahesh Reddy P	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
35.	S1914645	Sayantan Pal	15	16	17	17	18	19	20	21	22	23	24	25	26	27	28
36.	S1914624	Chetan G	15	16	17	18	19	20	21	22	23	24	25	26	26	27	28
37.	S1914628	Sainath Reddy	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
38.	S1914641	Prashanth	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
39.	S1914623	Charan P	16	17	18	18	19	20	21	22	23	24	25	26	27	28	29
40.	S1914631	Jibin K Job	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
41.	S1914616	Alan Thomas	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
42.	S1914625	Dhananjay	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
43.	S1914626	Dushyanth Tejas	14	15	16	17	18	19	20	21	22	23	24	25	26	27	27

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DBT Star College Scheme

SL. NO.	Reg. No.	Students Name	06/ 05	07/ 05	07/ 05	07/ 05	13/ 05	13/ 05	14/ 05	14/ 05	14/ 05	19/ 05	21/ 05	21/ 05	26/ 05	28/ 05	28/ 05
44.	S1914651	Yashwanth	15	16	17	17	18	19	20	21	22	23	24	25	26	27	28
45.	S1914648	Shraddha	15	15	16	17	18	19	20	20	21	22	23	24	25	26	27
46.	S1914632	Karthik M Acharya	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
47.	S1914629	Harshitha B C	15	16	16	17	17	18	19	20	21	22	23	24	25	26	27

  
Course coordinator

  
HOD

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

  
Principal

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1.	R2017635	Nagendra.N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.	R2017678	Vinutha YN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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9.	S1914644	Sai Pradyumna	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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18.	R2017668	Supriya GR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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23.	R2017611	B. S. Anshu	1	2	3	4	5	6	7	8	9	10	11	12	12	13	14
24.	R2017606	Alok N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
25.	R2017640	Pooja R	1	2	2	3	4	5	6	7	8	9	10	11	12	13	14
26.	R2017645	RAHUL C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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28.	R2017657	Sandeep Kumar M	1	2	2	3	4	5	6	7	7	8	9	10	11	12	13
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30.	R2017636	Naveen E	1	2	3	4	5	5	6	7	8	9	10	11	11	13	14
31.	R2017620	Gorantla Yeshaswini	1	2	3	3	3	4	5	5	6	7	8	9	10	11	12
32.	S1914635	Mohammed Ryhan Khan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
33.	S1914617	Aman Kaushal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
34.	S1914640	Mahesh Reddy P	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
35.	S1914645	Sayantan Pal	1	2	2	3	4	5	6	7	7	8	9	10	11	12	13
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38.	S1914641	Prashanth	1	2	2	3	3	4	5	6	7	8	9	9	10	11	12
39.	S1914623	Charan P	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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41.	S1914616	Alan Thomas	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
42.	S1914625	Dhananjay	1	2	3	4	4	5	6	7	8	9	10	11	11	12	13
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46.	S1914632	Karthik M Acharya	1	2	3	4	5	6	7	8	9	10	10	11	12	13	14
47.	S1914629	Harshitha B C	1	2	3	4	5	6	7	8	9	10	10	11	12	13	14

Course coordinator

HOD

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# CERTIFICATE

## DEPARTMENT OF ELECTRONICS

This is to certify that \_\_\_\_\_ of \_\_\_\_\_ had participated in a Value Added Course on "**Robotics & Applications**", from 28<sup>th</sup> Apr 2022 to 28<sup>th</sup> May 2022. Organized by the Department of Electronics (under DBT Star college scheme), M S Ramaiah college of Arts Science and Commerce Bengaluru -54.

**Dr. Prathiba V K**  
HOD, Dept. of Electronics,  
MSRCASC

**Ms Rithu R**  
Program Co-ordinator,  
MSRCASC

**Dr. A Nagarathna**  
Principal,  
MSRCASC