



AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING

Approved by All India Council for Technical Education - New Delhi, Affiliated to Anna University, Chennai
NAAC Accredited Institution

"Nizara Educational Campus", Muthapudupet, Avadi - IAF, Chennai - 600 055.

ANNA UNIVERSITY COUNSELLING CODE : 1101



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Dated on: 3/3/2021

CIRCULAR

FACULTY MEMBERS AND STUDENTS

We have planned to conduct Value Added course in our department on the topic "ROBOTICS" from 4/3/2021 to 9/3/2021 therefore I request all the Faculty members and students to attend the course and make utilization of the course for your future.

Resource Person:

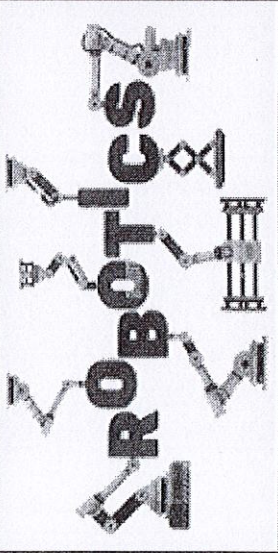
Mr. G.V. CHANDRAKANTH., B.E., M.B.A., LLB(HONS)
CO-FOUNDER, CTO,
ICUBE ROBOTICS

A.S. Salma Banu
3/3/21

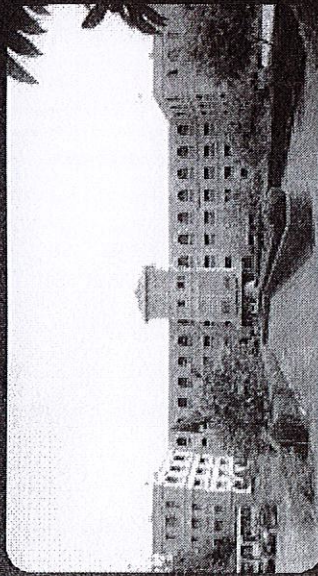
Prof. Dr. A.S.SALMA BANU
HoD/ECE



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VALUE ADDED COURSE



Dr. A.S. Salma Banu
Head of the Department

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ENGINEERING**

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

RESOURCE PERSON

G.V. Chandrakanth, B.E.,

MBA., LLB(HONS)

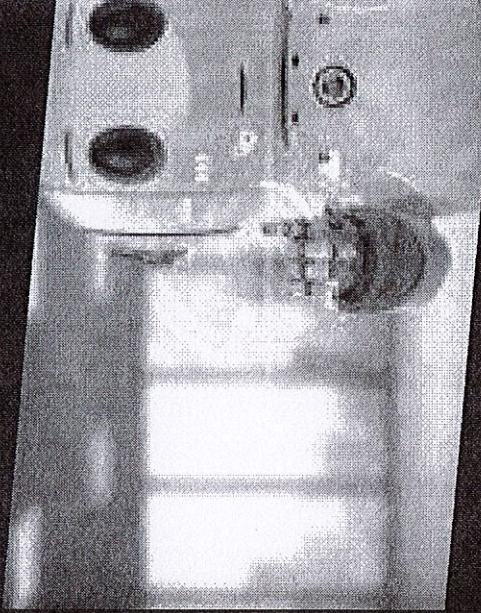
CO-FOUNDER, CTO

ICUBE ROBOTICS

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Dr. S. Sathish
Principal

ROBOTICS



4th March to 9th March
2021

Alhaj. S. Segu Jamaludeen
Secretary & Correspondent



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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

VALUE-ADDED COURSE-SUMMARY REPORT

COURSE NAME: ROBOTICS

Date: 04/03/2021 to 09/03/2021

Time: 9:00 am to 12 pm & 1 pm to 4 pm

No. of Days: 5

No. of Modules: 5

Course Hours: 30

Mode of Conduction: Online

Speaker: G.V.CHANDRAKANTH

Attended Students: 63

Objective of the Course:

This course aims to provide participants with advanced skills in robotic motion planning, control, perception, and learning, focusing on techniques that enable robots to navigate, perceive, and interact with complex environments autonomously.

Summary of the Course:

This course explores advanced robotics topics critical for developing intelligent, autonomous systems. It begins with motion planning and trajectory optimization techniques like RRT* and A* for collision-free, efficient path planning. The course then covers Simultaneous Localization and Mapping (SLAM) for real-time mapping and localization in unknown environments, essential for autonomous vehicles.

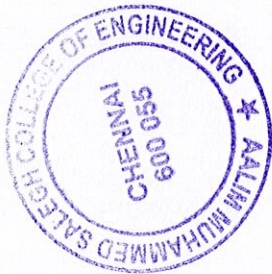




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Course Outcomes:

Upon completing this course, participants will be able to:

1. **Advanced Motion Planning and Trajectory Optimization:** Apply path planning and trajectory optimization algorithms (e.g., RRT*, A*, optimization-based methods) to design collision-free, energy-efficient, and dynamically feasible paths in complex environments.
2. **Simultaneous Localization and Mapping (SLAM):** Implement advanced SLAM techniques, such as EKF-SLAM and Graph-SLAM, to enable reliable localization and mapping in unknown environments, utilizing data from sensors like Lidar and cameras.
3. **Model Predictive Control (MPC) for Robotics:** Use Model Predictive Control to create responsive control strategies for real-time applications, making autonomous robots adaptable to changing environments and capable of constraint-aware decision-making.
4. **Robot Perception and Sensor Fusion:** Integrate sensor data from multiple sources (Lidar, cameras, IMUs) to enhance environment perception, employing sensor fusion techniques like Kalman and Particle Filters to support tasks such as obstacle avoidance and navigation.




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AVADI - IAF, MUTHAPUDUPE
CHENNAI 600 055

Place: Chennai
Date: 25 /02/2021

From:

Head of the Department
Department of ECE
Aalim Muhammed Salegh College of Engineering
Avadi IAF, Muthapudupet
Chennai - 600055

To:

The Principal
Aalim Muhammed Salegh College of Engineering
Avadi IAF, Muthapudupet
Chennai - 600055

Respected Sir,

Sub: Requisition for the approval to conduct Value Added course in our ECE department – Reg.

We wish to conduct Value Added course in our ECE department on the topic
“ROBOTICS” an Alumni Guest Lecture Series From 04/03/2021 to 09/03/2021.

Resource Person:

Mr. GV. CHANDRAKANTH, B.E.M.B.A.LLB(HONS)
Co-Founder, CTO
ICUBE ROBOTICS

The objective of conducting this Value Added course will give the industry focus in developing skills required by using latest technology advancement in “ROBOTICS”. This effort will benefit our Student’s community and bring core strength in engineering field.

Thank you.

Yours truly,

A. S. Salmabanu
25/02/21

Professor Dr. A. S. SALMABANU
Head of the Department/ECE
AMSCE, Chennai -55



Shafiq
25/2/21
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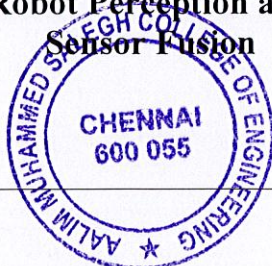


DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING CERTIFICATE COURSE-ROBOTICS

Academic Year: (2020-2021)

COURSE CONTENT:

Day/Date	CONTENT	Description	HOURS
Day 1	Advanced Motion Planning and Trajectory Optimization	<ul style="list-style-type: none"> Essential for autonomous navigation, particularly in complex environments, these techniques enable robots to plan paths that are collision-free, energy-efficient, and dynamically feasible. They include algorithms like RRT*, A*, and optimization-based methods that consider kinematic and dynamic constraints. 	6
Day 2	Simultaneous Localization and Mapping (SLAM)	<ul style="list-style-type: none"> SLAM is crucial for enabling robots to map and localize in unknown environments. Advanced SLAM techniques (e.g., EKF-SLAM, Graph-SLAM) use data from Lidar, cameras, and other sensors to provide reliable localization and environment mapping, which is vital for autonomous vehicles and mobile robots. 	6
Day 3	Model Predictive Control (MPC) for Robotics	<ul style="list-style-type: none"> MPC is a powerful control strategy for robots, particularly in applications requiring real-time decision-making under constraints. It's widely used in dynamic systems like drones and autonomous vehicles, where the robot needs to react and adapt to changes in the environment in real time. 	6
Day 4	Robot Perception and Sensor Fusion	<ul style="list-style-type: none"> Integrating data from multiple sensors (e.g., Lidar, cameras, IMUs) allows robots to perceive their environment accurately. Advanced sensor fusion techniques, including Kalman filters, Extended Kalman Filters (EKF), and Particle Filters, enable robust state estimation, which is essential for tasks like obstacle 	6



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		avoidance and autonomous navigation.	
Day 5	Reinforcement Learning for Robotics	<ul style="list-style-type: none"> Reinforcement learning (RL) is increasingly used for developing intelligent and adaptive robotic behavior, especially in complex, unstructured environments. Using RL, robots learn optimal policies through trial and error, which is useful for tasks such as robotic manipulation, autonomous navigation, and multi-agent coordination. 	6

TOTAL=30 HRS



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Value Added Course Tentative Time Table And Schedule

Value Added Course Name: Robotics

Date of Commencement: From 04/03/2021

Timing: 9:00 am to 12 pm & 1 pm to 4 pm

Tentative Date of Exam- 09/03/2021

Tentative Course Schedule - 04/03/2021 to 09/03/2021 (As per following)

No. Of Days: 5

Course Hours: 30

Speaker: Mr. G.V.CHANDRAKANTH

1. Module -1: Advanced Motion Planning Trajectory Optimization– 04-03-2021 – 6 Hours
2. Module -2: Simultaneous Localization & Mapping (SLAM)– 05-03-2021 – 6 Hours
3. Module -3: Model Predictive Control (MPC) for Robotics– 06-03-2021 – 6 Hours
4. Module -4: Robot Perception & Sensor Fusion– 08-03-2021 – 6 Hours
5. Module -5: Reinforcement Learning for Robotics– 09-03-2021 – 6 Hours




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Department of Electronics and Communication Engineering

Value Added Course: Robotics (2020-2021)

S.No	Reg No	Name of the Student	4/3/21	5/3/21	6/3/21	8/3/21	9/3/21
1	110118106001	ABDUL HAMEED J	/	/	/	/	/
2	110118106003	AFRIN FATHIMA S A	/	/	/	/	/
3	110118106004	AL THOWHEED AHMED B	/	/	/	/	/
4	110118106005	ARAVIND KUMAR M	/	/	/	/	/
5	110118106006	ARFATH ALI S	/	/	/	/	/
6	110118106007	ARSHIYA Z	/	/	/	/	/
7	110118106008	FARHEEN ANJUM B	/	/	/	/	/
8	110118106009	FARITHA BANU K	/	/	/	/	/
9	110118106010	HAKKIM ARSATH M	/	/	/	/	/
10	110118106011	HALEEMA HUMAIRA P M S	/	/	/	/	/
11	110118106012	JAUHAR FATHIMA B	/	/	/	AB	/
12	110118106013	KREETHIKA V	/	/	/	/	/
13	110118106014	MOHAMED ASSAIN M	/	/	/	AB	/
14	110118106015	MOHAMED FARDEEN S	AB	/	/	AB	/
15	110118106016	MOHAMED FAZIL S	/	/	/	/	/
16	110118106017	MOHAMED HAJA PARVEZ S	/	/	/	/	/
17	110118106019	MOHAMED SAFEER P	/	/	/	/	/
18	110118106020	MOHAMMED AAQIB A	/	/	/	/	/
19	110118106021	MOHAMMED JUNAID A	/	/	/	/	/
20	110118106022	MOHAMMED MUKBHIL HUDHA A	/	/	/	/	/
21	110118106023	MOHAMMED RASUL A	/	/	/	/	/
22	110118106024	MOHAMMED THABRAZ J	/	/	/	/	/
23	110118106025	MOHD IRFAN KHAN Z	/	/	/	/	/
24	110118106026	SATHIYAPRIYA S	AB	AB	/	AB	/
25	110118106027	SHABEER B	/	/	/	/	/
26	110118106028	SHAIK ABDUL KADER S.H	/	/	/	/	/
27	110118106029	SYED MOHAMMED S	/	/	AB	/	/
28	110118106030	THABEER MOHAMED BURVEZ M	/	/	/	/	/
29	110118106301	BHASHEETH R	/	/	/	/	/
30	110118106302	DHAWOODH KHAN H	/	/	/	/	/
31	110118106303	FARHAN MOHAMMED B	/	/	/	/	/
32	110118106305	MURALI KRISHNA S	/	/	/	/	/
33	110118106306	SUNIL KUMAR C H	/	/	/	X	/




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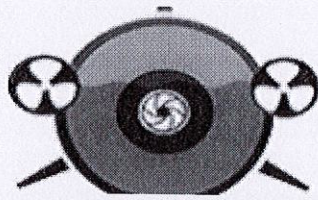
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1	110119106001	ABDUR RAHMAN M Y	/	/	/	/	/
2	110119106002	AFFAN NABEEL A	/	/	/	AB	/
3	110119106003	AMEENA S	/	/	/	/	/
4	110119106004	ARUN KUMAR B	/	/	AB	/	/
5	110119106005	KISHORE ARAVIND M	/	/	/	/	/
6	110119106006	MATEEN AHMED N	/	/	/	/	/
7	110119106007	MD TAHIR PR	/	/	AB	AB	/
8	110119106008	MOHAMED ABDULLAH I	/	/	/	AB	AB
9	110119106009	MOHAMED ABUSALIH K	/	/	/	/	/
10	110119106010	MOHAMED FUZAIL A	/	/	/	/	/
11	110119106011	MOHAMED HASSAN S	AB	AB	AB	AB	AB
12	110119106012	MOHAMED IRFAN A	/	/	/	/	/
13	110119106013	MOHAMED ISHAQ R	/	/	/	/	/
14	110119106014	MOHAMED ISMAIL J	/	/	/	/	/
15	110119106016	MOHAMED JAVITH NAZEEM N	/	AB	/	/	/
16	110119106017	MOHAMED KALIFATHULLAH M	AB	/	/	/	/
17	110119106018	MOHAMMED FAZIL A	AB	AB	AB	AB	AB
18	110119106019	MOHAMMED RAHIM A	/	/	/	/	/
19	110119106020	NADAVALA SASI VADHAN	/	/	/	/	/
20	110119106021	NITHIN A	/	/	/	/	/
21	110119106022	PRASANNA KUMAR S	/	/	/	/	AB
22	110119106023	RAHAMAAAN A R	/	/	/	/	/
23	110119106024	SADHU BALA SAI KRISHNA	/	/	AB	/	/
24	110119106025	SEENI HABEBU MOHAMED A	/	/	/	/	AB
25	11011910626	SHAHID HUSSAIN N	/	/	/	/	/
26	110119106029	SYED ALI NOVVAL	/	/	/	/	/
27	110119106030	SYED IRFAN K	/	/	/	/	/
28	110119106031	THANGARANI K	/	/	/	/	AB
29	110119106032	TOUHEED KHAN S	/	/	/	/	/
30	110119106301	MOHAMED ASWERDEEN M	/	/	/	AB	/
31	110119106302	MOHAMED YASEEN	/	/	/	/	/
32	110119106501	P.V.KRISHVA KESAV	AB	AB	AB	AB	AB
33	110119106701	H.MUBEENA	/	/	/	/	/



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PLANYS
TECHNOLOGIES

C-ID:2120611

CERTIFICATE
OF APPRECIATION

THE FOLLOWING AWARD IS GIVEN TO

AL THOWHEED AHMED B

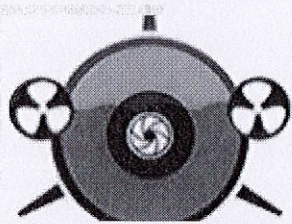
has Successfully completed 5 days Value Added Course in "ROBOTICS" From
04/03/2021 to 09/03/2021. We appreciate your hard work & Sincerity towards your
course and wish you good luck for your future endeavor.

Speaker

Chief Executive Officer &
heads business development,
marketing

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PLANYS
TECHNOLOGIES

C-ID:2120622

CERTIFICATE
OF APPRECIATION

THE FOLLOWING AWARD IS GIVEN TO

ARAVIND KUMAR M

has Successfully completed 5 days Value Added Course in "ROBOTICS" From 04/03/2021 to 09/03/2021. We appreciate your hard work & Sincerity towards your course and wish you good luck for your future endeavor.

Chandrasekhar

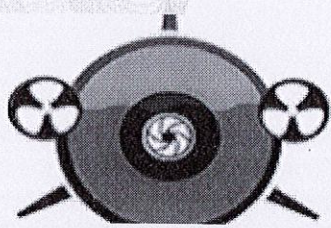
Speaker

Tanuj

Chief Executive Officer &
heads business development,
marketing

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PLANYS
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C-ID:2120632

CERTIFICATE
OF APPRECIATION

THE FOLLOWING AWARD IS GIVEN TO

ABDUR RAHMAN Y

has Successfully completed 5 days Value Added Course in "ROBOTICS" From 04/03/2021 to 09/03/2021. We appreciate your hard work & Sincerity towards your course and wish you good luck for your future endeavor.

Chandrasekhar

Speaker

Tanuj

Chief Executive Officer &
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[Signature]
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