



# RajaRajeswari College of Engineering



(Approved by AICTE, New Delhi, Govt. of Karnataka, Affiliated to Visvesvaraya Technological University, Belagavi)  
#14, Ramohalli Cross, Kumbalgodu, Mysore Road, Bengaluru – 560074

## Department of Robotics and Automation

### Faculty Knowledge Enhancement

NAME OF THE DEPARTMENT: Department of Robotics and Automation

1. Type of Event : AICTE – VTU Joint Teachers Training Programme  
One Week Online Teachers Training Program On  
“Robotics & Artificial Intelligence”
2. Date of the programme : 24th to 28th April 2023
3. Faculty members participated: Dr.M.Karthikeyan, Professor and Head  
Department of Robotics and Automation  
RajaRajeswari College of Engineering  
Bengaluru 560074

**-Report prepared by Dr.M.Karthikeyan, HOD-R&A**



# **AICTE – VTU Joint Teachers Training Programme**

## **VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

Centre for Post-Graduate Studies, VIAT, Muddenahalli, Chikkaballapur (Dist.) -562101.

One Week Online Teachers Training Program

On

**“Robotics & Artificial Intelligence”**

**24<sup>th</sup> – 28<sup>th</sup> April 2023**

# *Certificate*

*This is to certify that Mr. /Mrs. /Dr. /Prof. **M.Karthikeyan** of **RajaRajeswari College of Engineering** has participated and successfully completed One Week Online AICTE–VTU Joint Teachers Training Programme on **“Robotics & Artificial Intelligence”** from **24<sup>th</sup> to 28<sup>th</sup> April 2023** Organized by Visvesvaraya Technological University, Centre for PG Studies, VIAT, Muddenahalli, Chikkaballapur (Dist.) - 562101.*

**Dr. Basawaraj**

Programme Coordinator & Associate  
Professor, Dept. of Aerospace Engg.  
VTU CPGS, Muddenahalli

**Dr. N. Chikkanna**

TU Coordinator, Professor & Chairman  
Dept. of Aerospace Engineering  
VTU CPGS, Muddenahalli.

**Dr. Rangaswamy B E**

Registrar  
Visvesvaraya Technological University,  
Belagavi.





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

"ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ



## Visvesvaraya Technological University

(State University of Government of Karnataka Established as per the VTU Act, 1994)



Prof. B. E. Rangaswamy Ph.D.

Phone No: (0831) – 2498100

Registrar

Fax No. : (0831) – 2405467






Ref. No.: VTU/ROB/2022-23/ 7188

Date: 8 MAR 2023

### CIRCULAR

Sub: Deputation of Teaching Faculty Members of AICTE approved and VTU Affiliated Colleges for the AICTE-VTU Joint Training Programs (Online).  
Ref: Hon'ble Vice Chancellor's approval dated 07.03.2023.

With reference to the above subject, this is to inform you that, AICTE-VTU is jointly organizing the Training programme on the following courses. The objective of the Training programme is to enhance the faculty's expertise and teaching skills in the courses introduced as per NEP 2020.

Sl. No	Topic	Date	Programme Coordinators	Online Registration Link/ QR Code
1	Introduction to Python Programming & its Applications	13 <sup>th</sup> -17 <sup>th</sup> March 2023 (5 Days)	Dr. K Thippeswamy, Professor, Dept. of Computer Science & Engineering, VTU PG Center, Mysore Mob: +91-7019605611 Email: thippeswamy@vtu.ac.in	 <a href="https://forms.gle/nw7QrX7cA4XXbP2UA">https://forms.gle/nw7QrX7cA4XXbP2UA</a>
2	Analog VLSI design using EDA Tools	20 <sup>th</sup> – 25 <sup>th</sup> March 2023 (22/03/2023 Holiday)	Dr. Sarika Raga, Associate Professor & Programme Coordinator, Dept. of Electronics & Communications Engineering, VTU CPGS, Muddenahalli. Mob: +91-9481470671 Email: raga.sarika@gmail.com	 <a href="https://forms.gle/VxBVDe8WXChkNjQ9">https://forms.gle/VxBVDe8WXChkNjQ9</a>
3	Introduction to Web Programming	27 <sup>th</sup> – 31 <sup>st</sup> March 2023 (5 Days)	Dr. Shivamurthy G, Associate Professor & Programme Coordinator, Dept. of Computer Science & Engineering, VTU CPGS, Muddenahalli. Mob: +91-9845603236 Email: kgshivam@gmail.com	 <a href="https://forms.gle/F9fXzurMHT4ZBRhPA">https://forms.gle/F9fXzurMHT4ZBRhPA</a>
4	Introduction to Internet of Things (IoT)	17 <sup>th</sup> -21 <sup>st</sup> April 2023 (5 Days)	Dr. Nirmala Hiremani, Assistant Professor, Dept. of Computer Science & Engineering, VTU CPGS, Muddenahalli. Mob: +91-9483570925 Email: nirmalavtupg@gmail.com	 <a href="https://forms.gle/FT1fBXKVnKwyfy4w9">https://forms.gle/FT1fBXKVnKwyfy4w9</a>
5	Robotics & Artificial Intelligence	24 <sup>th</sup> – 28 <sup>th</sup> April 2023 (5 Days)	Dr. Basawaraj, Associate Professor Dept. of Aerospace Engineering, VTU CPGS, Muddenahalli. Mob: +91-9986157177 Email: basawaraj.2009@gmail.com	 <a href="https://forms.gle/YYG8NAWDAFDafUVE6">https://forms.gle/YYG8NAWDAFDafUVE6</a>

For more information you may contact, Dr. N Chikkanna, TU Coordinator & Professor, Dept. of Aerospace Engineering, VTU CPGS, Muddenahalli, Mob: 9845629287

Hence, you are hereby requested to depute one or two Faculty Members of your college to the above said **Online** training program and encourage the faculty members to enrich their teaching skills.  
**(There will be no Registration Fee)**

By Order,  
Ras 08/03/23 BE  
Registrar  
A

To,

1. The Principals of all the Affiliated / Constituent / Autonomous Engineering Colleges and School of Architecture of VTU.
2. The Chairpersons / Programme Coordinators of all the Departments, Centres for PG Studies of VTU in Muddenahalli, Belagavi, Kalaburgi and Mysuru.

**Copy to:**

1. The Hon'ble Vice Chancellor through his secretary, VTU, Belagavi – for kind information.
2. The Finance Officer, VTU, Belagavi - for kind information.
3. The Regional Directors (I/c), VTU Regional Centres at Bengaluru, Belagavi, Kalaburgi and Mysuru for information

**AICTE-VTU Joint Teachers Training  
Programme for AICTE Approved & VTU  
Affiliated Technical Institution Teachers**

**One Week Teachers Training Programme**

**On**

**“Robotics & Artificial Intelligence”**

**24<sup>th</sup> to 28<sup>th</sup> April 2023**

**REGISTRATION FORM**

Name: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Mobile: \_\_\_\_\_

Email: \_\_\_\_\_

**Declaration by the Applicant**

If selected, I agree to abide by the rules and regulations of the training Programme of VTU-HRDC and shall attend all the sessions compulsorily.

Date: \_\_\_\_\_ Signature of the Applicant

Recommended and Forwarded

Signature of the Head of the Institution

**CHIEF PATRON**

**Dr. S Vidyashankar**

Hon'ble Vice Chancellor, VTU, Belagavi

**PATRONS**

**Dr. B.E. Rangaswamy**

Registrar, VTU, Belagavi

**Dr. T.N Sreenivasa**

Registrar (Evaluation), VTU, Belagavi

**Smt. M. A. Sapna**

Finance Officer, VTU, Belagavi

**Dr. Amit Kumar Srivastava**

Director, FDC, AICTE, New Delhi

**Dr. H R Sudarshana Reddy**

Regional Director (I/c), VTU Regional Office, Bengaluru  
& Coordinator, VTU CPGS, VIAT, Muddenahalli

**University Coordinator**

**Dr. N Chikkanna**

Professor & Chairman, Dept of Aerospace Engineering,  
VTU CPGS, VIAT, Muddenahalli

**Programme Coordinator**

**Dr. Basawaraj.**

Associate Professor, Dept. of Aerospace Engineering,  
VTU CPGS, Muddenahalli

**ORGANISING COMMITTEE**

**Dr. Dinesh Rangappa**, Professor & Chairman, Dept. of Applied Sciences  
**Dr. T C Thanuja**, Professor & Programme Coordinator, Dept of M.Plan in Smart Cities  
**Dr. Shiva Murthy G**, Associate Professor & Programme Coordinator, Dept. of CSE  
**Dr. Thirtha Prasad H P**, Associate Professor & Programme Coordinator, Dept. of ME  
**Dr. Sarika Raga**, Associate Professor. & Programme Coordinator, Dept. of ECE  
**Dr. Roopadarshini S**, Assistant Professor & Programme Coordinator, Dept. of MBA  
**Dr. G S Venkatesh**, Professor, Dept of Mechanical Engineering  
**Dr. Anand Kumar C S**, Associate Professor, Dept. of Applied Sciences  
**Dr. K Gayathri Reddy**, Associate Professor, Dept. of MBA  
**Dr. Binoy Mathew**, Associate Professor, Dept. of MBA  
**Dr. H H Ramesha**, Associate Professor, Dept. of MBA  
**Dr. Pankajakshi K**, Associate Professor & Special Officer, VTU RO, Bengaluru  
**Dr. Nirmala Hiremani**, Assistant. Professor, Dept. of CSE  
**Dr. Prasanna D S**, Assistant. Professor, Dept. of Applied Sciences  
**Dr. Ashwin C Gowda**, Assistant. Professor, Dept of Mechanical Engineering  
**Dr. Kantha D Devangavi**, Assistant Professor, Dept. of CSE  
**Dr. Lakshminarayana K**, Assistant Professor, Dept. of MBA  
**Dr. Veenarani K**, Assistant Professor, Dept. of MBA  
**Mr. Sanjeev G Palekar**, Assistant Professor, Dept. of Aerospace Engineering  
**Mr. Prasad U Raikar**, Assistant Professor, Dept of Mechanical Engineering  
**Mr. Ravi H Talwar**, Assistant Professor. & Special Officer, VTU RO, Bengaluru  
**Mrs. Renuka Malge**, Assistant Professor, Dept. of CSE  
**Mr. Yadhu Naik B H**, Assistant Professor, Dept. of CSE  
**Mrs. Bhavana G**, Assistant Professor, Dept. of CSE  
**Mr. Vishwanath H**, Assistant Professor, Dept. of MBA  
**Mr. Anand M Raikar**, Research Scholar, Dept. of Aerospace Engineering

**AICTE-VTU Joint Teachers Training  
Programme for AICTE Approved & VTU  
Affiliated Technical Institution Teachers**

**One Week Teachers Training Programme**

**On**

**“Robotics & Artificial Intelligence”**

**24<sup>th</sup> to 28<sup>th</sup> April 2023**



**Organized By:**

**VTU- Human Resource Development Cell (HRDC)  
Visvesvaraya Technological University  
Centre for Post Graduate Studies Bengaluru  
Region, Muddenahalli  
Chikkaballapur-562101**

**Venue: Online**

**Platform: Zoom App**

## About VTU

Visvesvaraya Technological University (VTU) named after Bharat Ratna Dr. Sir M. Visvesvaraya established on 1st April 1998, as per the VTU Act 1994 of the Government of Karnataka. University has been established by the Government of Karnataka in order to promote planned and sustainable development of technical education and has its Head Office located in Belagavi in the state of Karnataka. Reckoning the fact that, University is a seat of confluence of knowledge and as a technological University, Visvesvaraya Technological University does not restrict itself only to curricular activities but also emphasizes on the overall growth of knowledge in society and hence its campus in Belagavi is named aptly as “Jnana Sangama”. The University has jurisdiction over the whole state of Karnataka. VTU has established four regional centers at Bengaluru, Mysuru, Kalburgi and Belagavi for administrative convenience. VTU is one of the prestigious and largest technological Universities in the India having one Constituent College, 220 Engineering colleges and 20 Autonomous Colleges.

VTU is imparting technical education to more than a lakh students under its 35 Undergraduate & 94 Postgraduate Programmes. VTU is offering Doctoral Programmes in 865 departments in various affiliated Colleges which have been recognized as research centers. Around 5000 Research Scholars are perusing for Doctoral and M.Sc. (Engineering) By Research Programmes. VTU has established full-pledged Centers for Post Graduate Studies at Muddenahalli, Kalburgi, Belagavi and Mysuru.

## About AICTE, New Delhi

All India Council for Technical Education (AICTE) was set up in November 1945 as a national-level apex advisory body to conduct a survey on the facilities available for technical education and to promote development in the country in a coordinated and integrated manner. And to ensure the same, as stipulated in the National Policy of Education (1986), AICTE was vested with:

- Statutory authority for planning, formulation, and maintenance of norms & standards
- Quality assurance through accreditation
- Funding in priority areas, monitoring, and evaluation
- Maintaining parity of certification & awards.

## About the VTU PG Centre, Muddenahalli

The Visvesvaraya Technological University, Post Graduate Center, Bengaluru Region, Muddenahalli has 200 acres campus located at Muddenahalli, Chikkaballapura (Dist). Muddenahalli is the birth place of great legend Bharata Ratna Sir M. Visvesvaraya. It has all necessary infrastructure required for imparting quality education through its well-structured administrative and academic staff for overall development of student's personality. Center for PG Studies has five full time post graduate Programmes in M.Tech, MBA and MCA. All the departments have well qualified faculty.

### PROGRAMME OBJECTIVES:

Robotics and AI Faculty development programme is intended to give in-depth knowledge on Robotic Manipulator, its configurations, Kinematics and Dynamics. The FDP also make the faculty familiar with the basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning. Ultimate aim of this programme is to integrate AI with Robotics

### Advantages of this FDP on Robotics and AI:

There are number of advantages when an Institute / College/ Faculty / Student choose to be socially connected and responsible, such as:

- Understand and apply the concepts of kinematics and dynamics of robotics for analyzing the problems
- Understand the basic concepts of coordinate system.
- Perform kinematic analysis of robots.
- Study inverse kinematics of robots.
- To study manipulator dynamics.
- Gain a historical perspective of AI and its foundations
- Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Experience AI development tools such as an ‘AI language’, expert system shell, and/or data mining tool.
- Experiment with a machine learning model for simulation and analysis.
- Explore the current scope, potential, limitations, and implications of intelligent systems.

This FDP also summarizes the main points of the university defined syllabus titled “Robotics & Artificial Intelligence”. It also functions as a platform for brainstorming, in-depth discussion, and clarifying the doubts of faculties who are willing to teach this course. This FDP helps all faculties and students to increase their understanding of Introduction to Robotics and AI, Showcase planning and organizational skills of all the stakeholders.

### RESOURCE PERSONS:

Renowned Experts from reputed Institutions, Senior Faculties of VTU and Industry Experts.

### ELIGIBILITY:

Teachers from AICTE Approved and VTU Affiliated Technical Institutes those who are interested in teaching the “**Robotics & Artificial Intelligence**” course.

### Registration Fee:

No Registration Fee

### How to Apply:

Registration through Google form link - <https://forms.gle/YYG8NAWDAFDafUVE6>

### Programme Timings (Each Day):

- (i) First session; 10.00 AM to 1.00 PM (3 hours).
- (ii) Lunch break: 1.00 PM to 1.30 PM
- (iii) Second session: 1.30 PM to 4.00 PM (2.30 hours).

### Certificate:

The certificate of participation for the faculty who registers for the Programme shall be issued, provided they satisfy the attendance requirement of 80 % of the 10 sessions held during five days of the Programme and secure 60 % of the maximum marks (100) prescribed for formative evaluation and summative evaluation.

### Contact for more Information:

#### Dr. Basawaraj

Associate Professor, Dept of Aerospace Engineering  
VTU CPGS, Muddenahalli  
Mobile: 9986157177  
Email: basawaraj.2009@gmail.com



# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Belagavi – 590018, Karnataka, India

(State Technological University, Govt. of Karnataka)

Center for Post Graduate Studies, VIAT, Muddenahalli, Chickaballapura-562101

AICTE-VTU Joint Training Programme for AICTE Approved & VTU Affiliated Institution Teachers

5 Days Training Programme on

**“Robotics and Artificial Intelligence”**

**24<sup>th</sup> to 28<sup>th</sup> April 2023**

## Programme Schedule

Day 1			
24.04.2023	10.00 - 10.30 AM	Inauguration of Training Programme	<b>Dr. B E Rangaswamy</b> Registrar, Visvesvaraya Technological University, Belagavi
			<b>Dr. N.Chikkanna</b> Technical University Coordinator, Professor & Chairman, Dept. of Aerospace Engineering, VTU PG Centre, VIAT, Muddenahalli
			<b>Dr. T C Manjunath</b> Professor & Head, Dept. of E&CE Dayananda Sagar College of Engineering, Bengaluru.
			<b>Dr. Basawaraj</b> Associate Professor, Dept of Aerospace Engineering, VTU, PG Centre, Muddenahalli
	10.30 AM - 1.00 PM	Introduction to Mechanism and Machine	<b>Dr. T C Manjunath</b> Professor & Head, Dept. of E&CE Dayananda Sagar College of Engineering, Bengaluru.
1.00 - 1.30 pm	Lunch Break		
1.30 - 4.30 pm	Robotic configuration and Spatial descriptions and transformations	<b>Dr. T C Manjunath</b> Professor & Head, Dept. of E&CE Dayananda Sagar College of Engineering, Bengaluru.	
Day 2			
25.04.2023	10.00 am - 1.00 pm	Manipulator Kinematics	<b>Dr. Shrinath R Katti,</b> Assistant Professor, Dept. of Mechanical Engineering NIET, Mysuru
	1.00 - 1.30 pm	Lunch Break	
	1.30 - 4.30 pm	Robot Operating Systems	<b>Dr. K R Prakash,</b> Professor, Dept. of Mechanical Engineering NIE, Mysuru
Day 3			

26.04.2023	10.00 am- 1.00 pm	Manipulator dynamics	<b>Sri. Vinod Kumar H P,</b> Assistant Professor, Dept. of Mechanical Engineering NIE, Mysuru
	1.00 - 1.30 pm	Lunch Break	
	1.30 - 4.30 pm	Path Planning & Navigation	<b>Dr. Akhil V M,</b> Assistant Professor Dept. of Mechanical Engineering Amritha Vishwa Vidya Peetam, Amruthapuri.
<b>Day 4</b>			
27.04.2023	10.00 am - 1.00 pm	Introduction – History, Definition of AI& its applications, Emulation of human cognitive process, Intelligent agents – The concept of rationality, the nature of environments, the structure of agents. SEARCH METHODS	<b>Dr. Reshma Banu</b> Professor Department of CSE VVIET, Mysuru
	1.00 - 1.30 pm	Lunch Break	
	1.30 - 4.30 PM	An Overview on Practical Design, Control and Application of AI for Robots-Case Studies	<b>Sri. Prashanth N,</b> Assistant Professor, Head, Centre for Robotics Research Dept. of Mechanical Engineering NMIT, Bangalore
<b>Day 5</b>			
28.04.2023	10.00 AM - 01.00 PM	Building a Robot- Simulator Path Planning – A*- Algorithm Object Detection, Collision Detection- Case Studies	<b>Dr. AV Sriharsha,</b> Professor CSE&DS, Mohan Babu University Sree Sainath Nagar, A.Rangampet-517102
	1.00 - 1.30 pm	Lunch Break	
	1.30 - 3.00 PM	Introduction to Computer Vision- OpenCV2 Object Identification – Case studies	<b>Dr. AV Sriharsha,</b> Professor CSE&DS, Mohan Babu University Sree Sainath Nagar, A.Rangampet-517102
	3.00 PM – 3.30 PM	Valedictory Function	
	3.30 PM – 4.30 PM	Online Test	

<b>Dr. Basawaraj</b> Associate Professor, Dept of Aerospace Engineering, VTU, PG Centre, Muddenahalli Mob: 9986157177 Email:basawaraj1970@gmail.com	<b>Dr. N.Chikkanna</b> TU-Coordinator, Professor & Chairman, Dept. of Aerospace Engineering, VTU PG Centre, VIAT, Muddenahalli. Mob: 9845629287 Email – nchikkanna1967@gmail.com
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# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Belagavi – 590018, Karnataka, India

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Center for Post-Graduation Studies, Muddenahalli, Chikkaballapur-562101

AICTE-VTU Joint Training Programme for AICTE Approved & VTU Affiliated Technical Institutions Teachers

One Week Training Programme on

**“Robotics & Artificial Intelligence”**

**24<sup>th</sup> to 28<sup>th</sup> April 2023**

## Inauguration Schedule

10.00AM - 10.05 AM	Welcome Address	<b>Dr. N.Chikkanna</b> Technical University Coordinator-AICTE& VTU – Joint Training Programme, Professor VTU PG Centre, VIAT, Muddenahalli.
10.05 AM – 10.20 AM	Prelude About FDP	<b>Dr. T C Manjunath</b> Professor & Head, Dept. of E&C Dayananda Sagar College of Engineering, Bengaluru.
10.20 AM - 10.30 AM	Vote of Thanks	<b>Dr. Basawaraj</b> Associate Professor, Dept of Aerospace Engineering VTU, PG Centre, Muddenahalli
<b>Master of Ceremony:</b> Dr. Basawaraj, Associate Professor, Dept of Aerospace Engineering, VTU, PG Centre, Muddenahalli		