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Department of Mechanical Engineering

REPORT

AICTE Training & Learning (ATAL) Sponsored
Faculty Development Program (**FDP**) on

Robotics and Artificial Intelligence

(07th to 11th Feb 2022)

DEPRTMENT OF MECHANICAL ENGINEERING

LAKIREDDY BAIL REDDY COLLEGE OF ENGINEERING, MYLAVARAM

AICTE TRAINING AND LEARNING ACADEMY, PUNE

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Report

on

AICTE Training & Learning (ATAL) Sponsored

Faculty Development Program (**FDP**) on

"Robotics and Artificial Intelligence"

07th Feb 2022 to 11th Feb 2022

Department of Mechanical Engineering, Lakireddy Bali Reddy College of Engineering (Autonomous) has organized **AICTE Training & Learning (ATAL) Academy** Sponsored online Faculty Development Program (FDP) on **"Robotics and Artificial Intelligence"** during **07th February 2022 to 11th February 2022**. For this FDP, 200 participants from different AICTE recognized institutes, industries, research scholars were registered across various parts of India and 139 participants have qualified for certification.

Day 1: 07th Feb. 2022

Inaugural Program:

Inaugural session of Faculty Development Program was started at 9:10 AM on 07th February 2022 by **Prof. Pandu Ranga Vundavilli**, Associate Professor, IIT Bhubaneswar, **Dr. K. Appa Rao**, Principal, LBRCE (A), **Mr. Jonnala Subba Reddy**, Associate Professor, Coordinator of this FDP, **Dr. S. Pichi Reddy**, Convenor, HoD, Dept. of MECH, **Dr. P. Ravindra Kumar**, Co-Convenor, Professor, Dept. of MECH, **Dr. E.V. Krishna Rao**, Professor and Dean R&D, **Dr. M. Srinivasa Rao**, Professor and Dean Academics, Co-Coordinators**, Mr. K. V. Viswanadh,** Sr. Asst. Prof.**, Mr. V. Venkatrami Reddy,** Asst. Prof. of Mechanical Engineering **and** HoDs of various departments.

Ms. S. Snigdha, Asst. Prof. has welcomed all the dignitaries and delegates and started with prayer song. She has started the event as per the program schedule of inaugural session and introduced dignitaries to the participants.

The Program Coordinator Mr. Jonnala Subba Reddy has extended warm welcome to all the dignitaries and participants. Further, he has emphasized the need for and importance of

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Robotics and Artificial Intelligence as a multidisciplinary area where a group of different branch people involved in designing and development of Robotic System. He has provided the details of all the resource persons along with complete Five-day schedule and necessary information required details about attendance, feedback, and assessment test for successful completion of this FDP.

Dr. S. Pichi Reddy, Convenor, HoD emphasized the department of Mechanical Engineering has been organizing FDPs in online mode from the past three yrs and informed about the department credentials. He had mentioned that the department is following outcome-based education and empowering the students to excel in respective areas of interest.

Dr. P. Ravindra Kumar, Professor and Convener of this FDP has requested all the participants to interact with resource persons to enhance their skills and to collaborate with them to find out the solution in their research areas. He thanked AICTE and all the organizers.

Dr. K. Appa Rao, Principal thanked AICTE Training and Learning (ATAL) academy for sponsoring this FDP and mentioned the credentials of the Institute. He has expressed his wishes to all the participants to enhance their skill set and to transform the same knowledge to the students to do their projects etc. He also informed this FDP will be beneficial to apply sponsored projects by gaining the skills to be applied for various societal problems. As this is emerging area and most industries using robotic systems, the students and faculty need to aware the control of robot by programming. He also thanked to our chief guest Dr. Pandu Ranga Vundavalli for accepting the invitation to attend ti program.

Chief Guest Dr. Pandu Ranga Undaalli, Associate Professor expressed his views on organizing such FDPs in online mode, will enhance the technical skills of the faculty which is very important to success for any organization. Due to computerization, computing technology and IOT technology, mechatronics, robotics, and artificial intelligence, nowadays playing crucial role in getting quality outputs from industries. He emphasized the importance of how to develop the cost-effective products and value-based products. It is also very important to predict the future with this kind technology to make use of technology effectively. He thanked all the people for conducting the event which is very useful to the society.

In the conclusion of the inaugural function, **Mr. K.V.Viswanadh** has proposed vote of thanks for all the dignitaries, delegates, management and AICTE Training and Learning (ATAL) Academy.
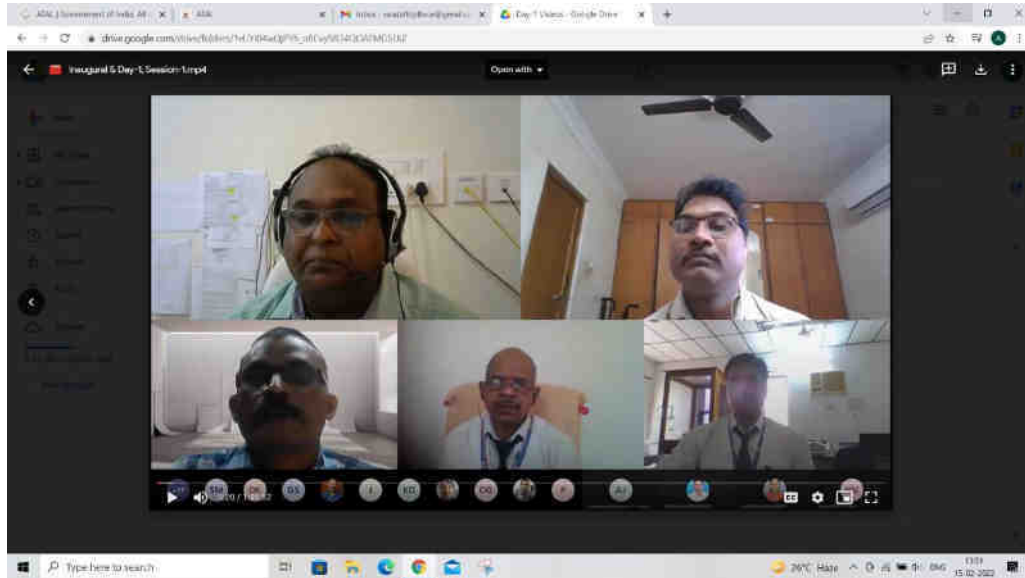
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Inaugural Speech by Dr. Pandu Ranga V, **Associate Professor, IIT Bhubaneshwar**

Dr. K. Appa Rao, Principal, LBRCE (A),

Dr. K. Harinadha Reddy, Vice- Principal, LBRCE (A)

Dr. S. Pichi Reddy, Convenor, HoD, Dept. of MECH.

Dr. P. Ravindra Kumar, Co-Convenor, Professor, Dept. of MECH.

Dr. E.V. Krishna Rao, Professor and Dean, R & D

Dr. M. Srinivasa Rao, Professor and Dean, Academics

Mr. Jonnala Subba Reddy, Coordinator of FDP, Dean R&D,

Mr. K.V. Viswanadh, Co- Coordinator, Sr. Asst. Professor, Dept. of MECH.

Mr. V. Venkatrami Reddy, Co- Coordinator, Asst. Professor, Dept. of MECH

HoDs of other departments

Participants

ATAL FDP on **"Robotics and Artificial Intelligence"** 07th Feb 2022 to 11th Feb 2022 organized by Mech Engg Dept, LBRCE

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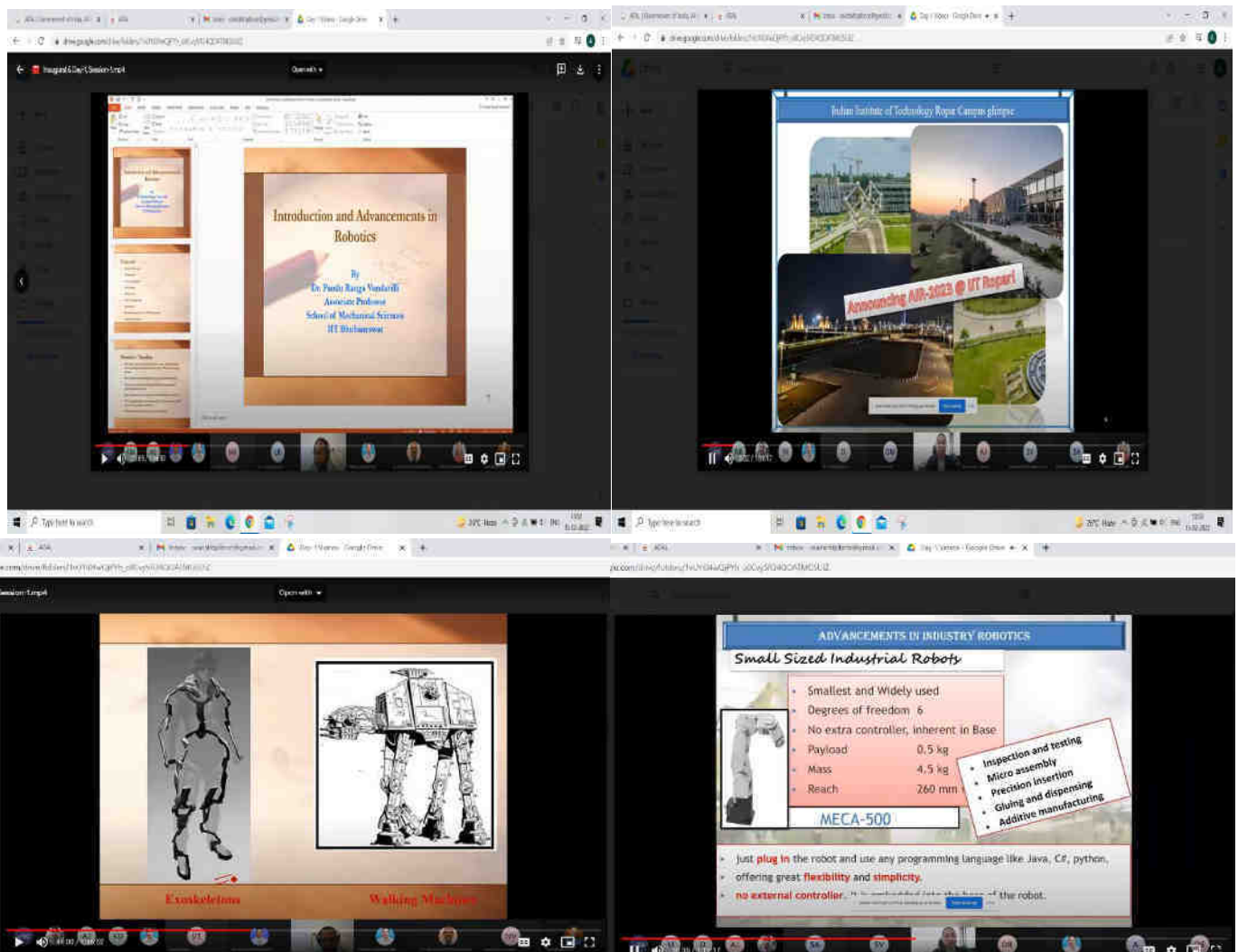**Department of Mechanical Engineering**

Day 1: 07th Feb. 2022

Session – 1: Topic: Introduction and its advancements in Robotics

Resource Person: Dr. Pandu Ranga Vundavilli, Associate Professor, IIT Bhubaneshwar

Dr. Pandu Ranga Vundavilli has presented history of robotics, anatomy, path planning, robot programming, industrial and non-industrial appellations of robotics. He has given deep insights about non-industrial applications where robot work with suitable live examples. Further, he emphasized the role of a design engineer in implementing ideas by considering design strategies in a systematic way. He also attempted to give overview of research contributions going on in IIT Bhubaneshwar.

Presentation by Prof. Pandu Ranga Vundavali
Associate Professor, Mechanical Sciences, IIT Bhubaneshwar
ATAL FDP on **"Robotics and Artificial Intelligence"** 07th Feb 2022 to 11th Feb 2022 organized by Mech Engg Dept, LBRCE

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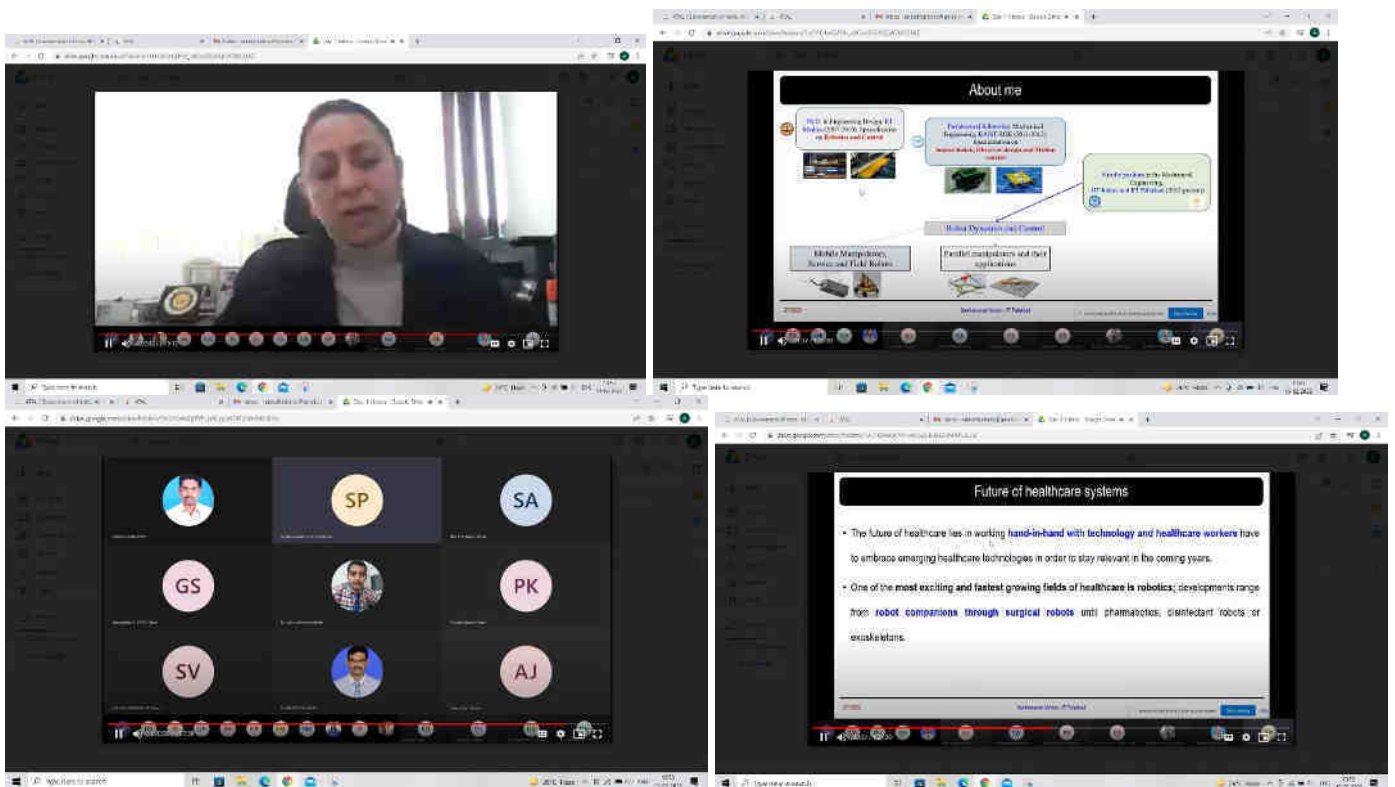## Department of Mechanical Engineering

Day 1: 07th Feb. 2022

Session – 2: Topic: Industrial Robotics Systems: A Journey of Five Decades

Resource Person: Prof. Ekta Singla, Associate Professor, IIT Ropar

Prof. Ekta Singla, IIT Ropar has delivered a talk on Robotics 3.0, Industry 4.0. She has discussed on manufacturing areas with robotic assistance. She emphasized on current technologies and their ability to find solutions to the real time problems. Further, she addressed the identification of limitations and challenges that occur with ongoing technological trends at automation industries and in what way those can overcome with potential approaches.

Presentation by

Dr Ekta Singla,
Associate Professor, IIT Ropar

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Day 1: 07ᵗʰ Feb. 2022

Session – 3: Rehabilitation Robots

Resource Person : Prof. Santhakumar Mohan, Indian Institute of Technology (IIT) Palakkad

Dr. Santhakumar Mohan has given lucid lecture that covers various aspects pertaining to robotic rehabilitation and assertive technologies market. He has given wide variety of examples to make participants better understandable. He has presented on therapy robots, assistive robots. He also presented the several case studies. Further, he emphasized the need for and importance of latest technology in robotics. He has mentioned the research areas in IIT Palakkad.
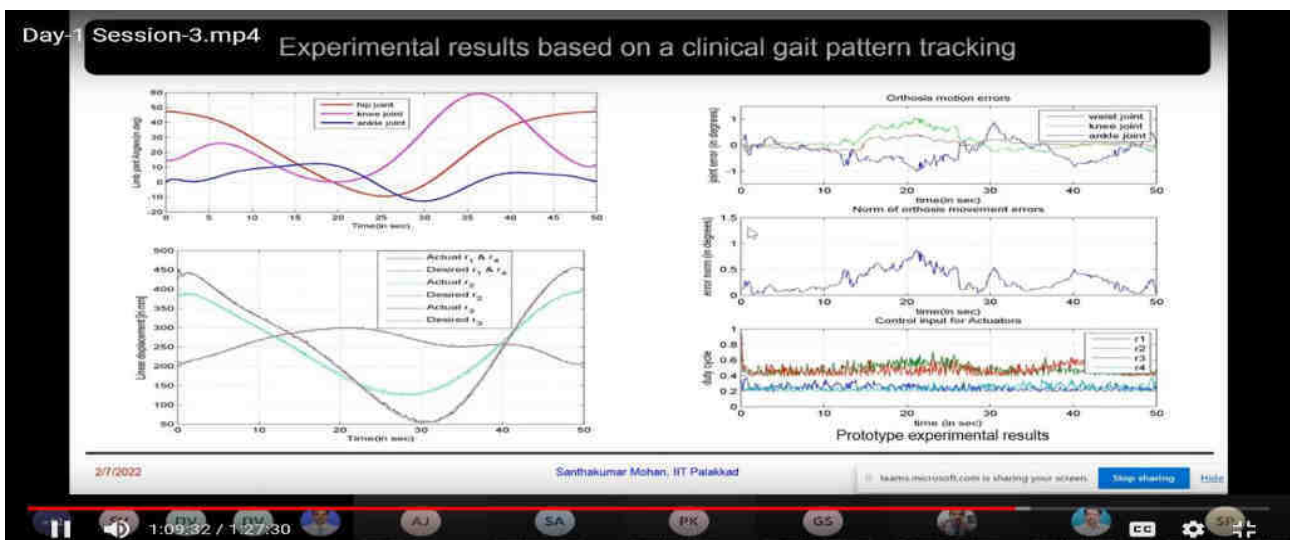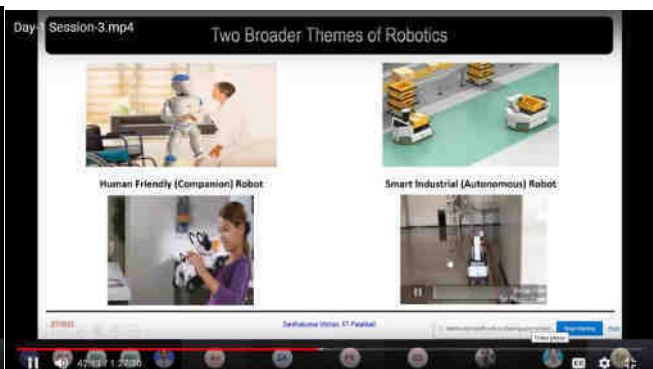
Presentation by

Dr. Santhakumar Mohan,
Associate Professor, IIT, Palakkad, Kerala

ATAL FDP on "**Robotics and Artificial Intelligence**" 07ᵗʰ Feb 2022 to 11ᵗʰ Feb 2022 organized by Mech Engg Dept, LBRCE

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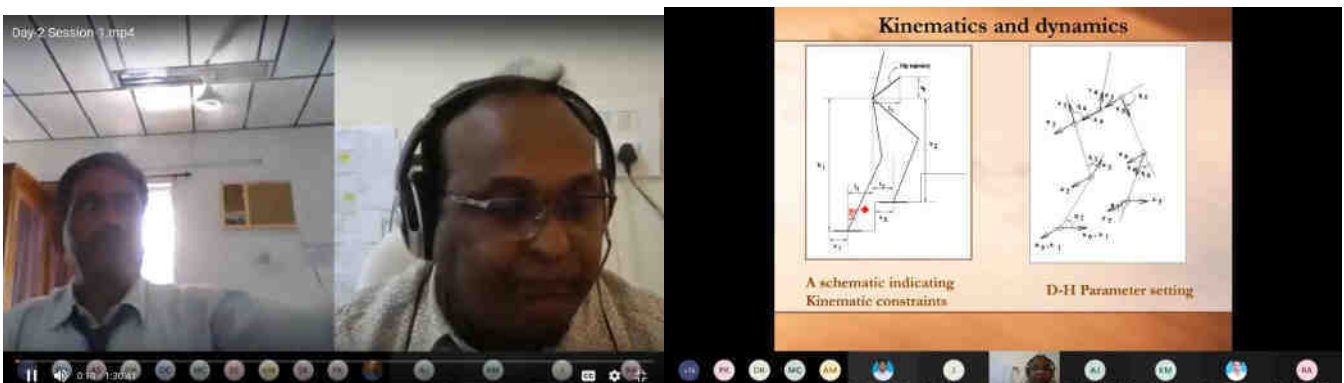## Department of Mechanical Engineering

Day 2: 08ʰ Feb. 2022

Session – 4: Biped Robotics

Resource Person: Prof. Pandu Ranga Vundavilli, Associate Professor IIT Bhubaneswar

Prof. Pandu Ranga Vundavilli has given fundamental aspects of design of biped robot. He has covered several examples and made session very interactive. He has also presented 7-dof biped robot, its dynamic aspects with suitable examples. He emphasized with soft computing, neural networks, fuzzy logic, genetic algorithms with appropriate examples. Also, he presented few research areas in which IIT Bhubaneshwar working with.

Presentation by Prof. Pandu Ranga Vundavali
Associate Professor, Mechanical Sciences, IIT Bhubaneshwar

ATAL FDP on "**Robotics and Artificial Intelligence**" 07ᵗʰ Feb 2022 to 11ᵗʰ Feb 2022 organized by Mech Engg Dept, LBRCE

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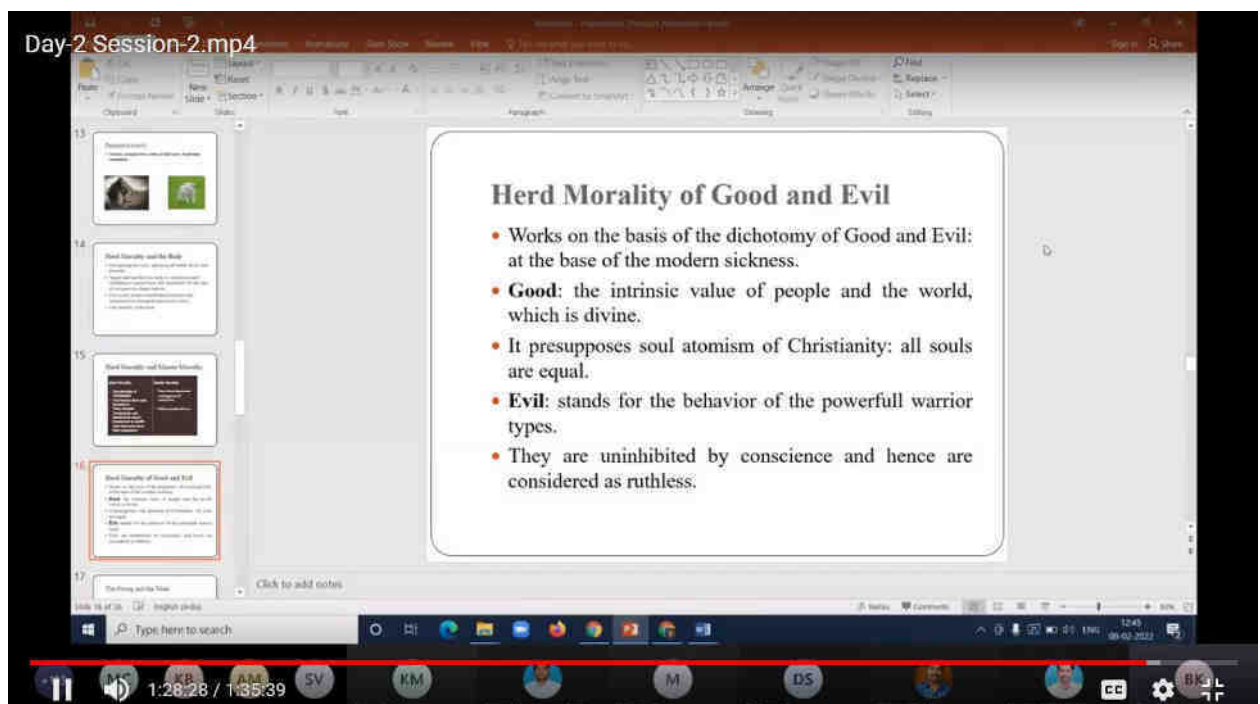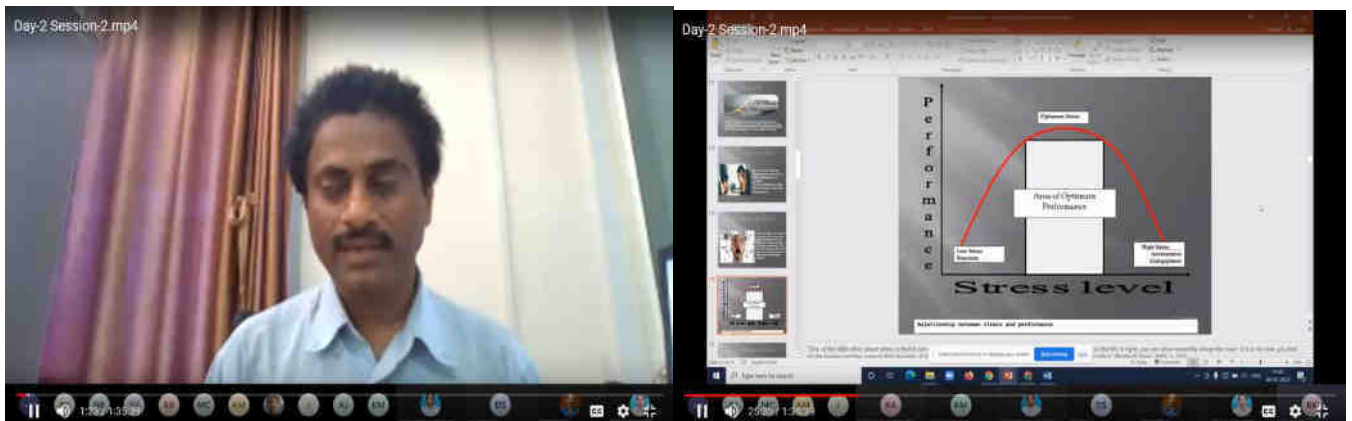Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.
Department of Mechanical Engineering

Day 2: 08ʰ Feb. 2022

Session – 5: Stress Management and Research Ethics

Resource Person: Dr. Bharath Kumar, Associate Professor, IIT, Tirupati

Dr. Bharath Kumar has presented about stress development and research ethics to develop new ideas by taking reviews of literature. He has also presented morality issues, how to reduce the stress etc. He has also discussed on how to reduce the stress, how to being a leader and ethical.

Presentation by
Dr. Bharath Kumar, Associate Professor, IIT, Tirupati

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Day 2: 08ʰ Feb. 2022

Session – 6: AI in reliability analysis of safety critical systems
Resource Person: Dr. Lalit Singh, Senior Scientist, NPCIL-BARC, Dept. of Atomic Energy, Government of India

Dr. Lalit Singh has presented the artificial skins used for robotic applications for day-to-day use. And he also elaborated Petri nets and modelling of systems, properties of Petri nets, analysis techniques, reliability prediction framework and design aspects are broadly discussed.

Presentation by
Dr. Lalit Singh, Senior Scientist,

NPCIL-BARC, Dept. of Atomic Energy, Government of India

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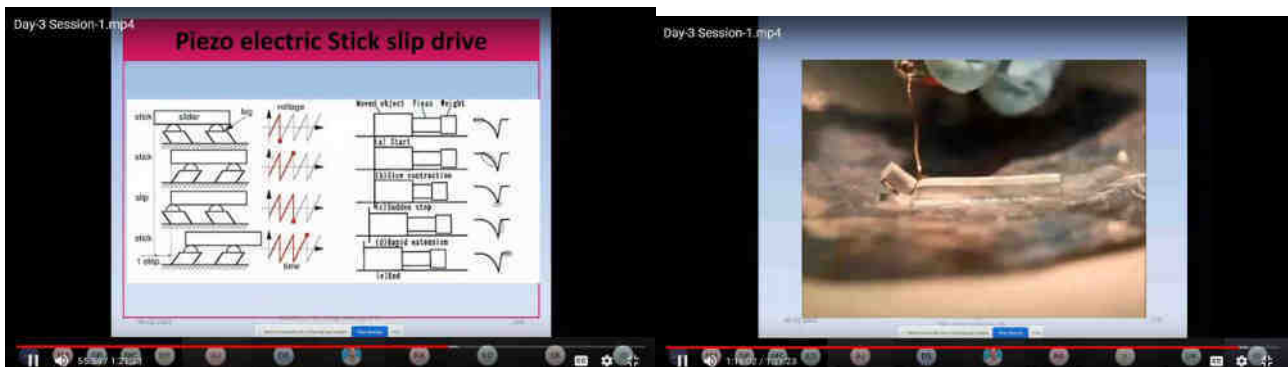Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.
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Day 3: 09ʰ Feb. 2022

Session – 7: Soft Robotics

Resource Person: Dr. I.A.Palani, Associate Professor and Dean R &D, IIT Indore.

Dr. I.A.Palani has delivered wonderful lecture on soft robotics. In particular, he has shown variety of technological developments made at their institution that facilitates participants to understand the bringing technology close to the normal public. Various design strategies have been implemented in developing products for variety of technological solutions for thorough understanding. He has covered underwater robots, smart actuators, simple memory polymer alloy, piezoelectric materials, drive mechanisms, vibration damper, ionic polymer, pneumatic artificial muscles etc.

Presentation by Dr. I.A.Palani,

Associate Professor and Dean R &D, IIT Indore

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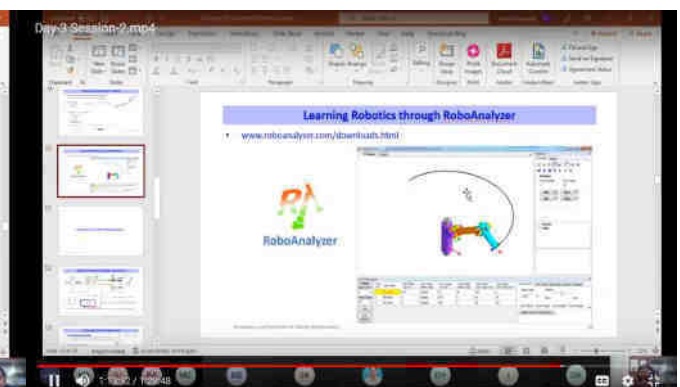Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.

Department of Mechanical Engineering

Day 3: 09ʰ Feb. 2022

Session – 8: Kinematics and Dynamics of Cobotic Manipulators

Resource Person: Prof. K. Rama Krishna, IIT Delhi

Dr. K. Rama Krishna has presented cobot and its essence, kinematic analysis of robotics, dynamic analysis of cobot systems with computations. He has demonstrated RoboAnalyzer software to understand the kinematics and dynamic aspects of robotics. He has also discussed about IHFC, which was set up at IIT Delhi to encourage the students to compete with controlling of robot with higher level programming. He has mentioned the applications of industrial robots.

Presentation by **Prof. K. Rama Krishna,**

Assistant Professor (G-II), IIT Delhi,

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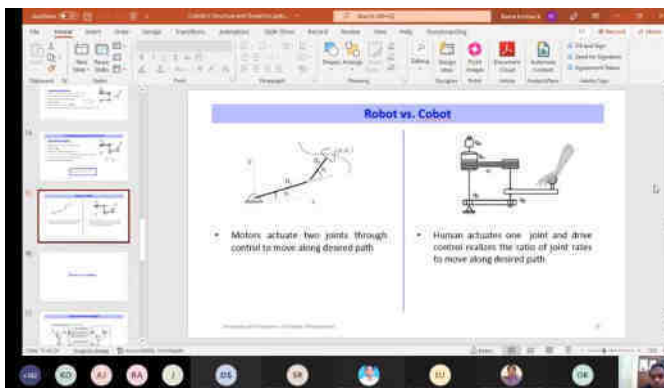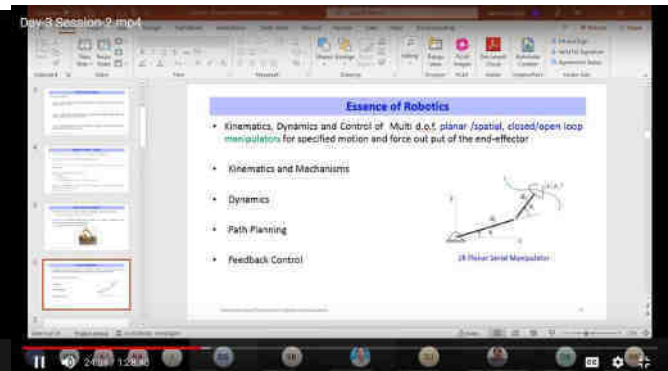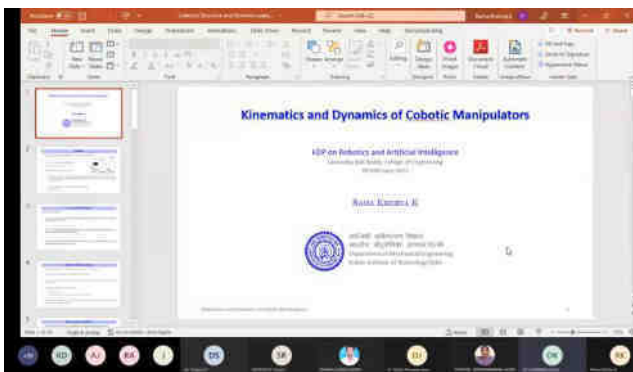**Department of Mechanical Engineering**

Day 3: 09ʰ Feb. 2022

Session – 9: Electrical Impedance Based Artificial Skins Characterizations for Robotics

Resource Person: Dr. Tushar Kanti Bera, Assistant Professor, National Institute of Technology (NIT) Durgapur

Dr. Tushar Kanti Bera, has presented electric power generation non-conventional, electrical impedance spectroscopy and its industrial applications. He has delivered the method of developing solution to real time problems by implementing systematic approach of design thinking strategies. He has delivered talk on EII & CT Techniques, artificial skins for robotic systems.

Presentation by
Dr. Tushar Kanti Bera,
Assistant Professor, National Institute of Technology (NIT) Durgapur

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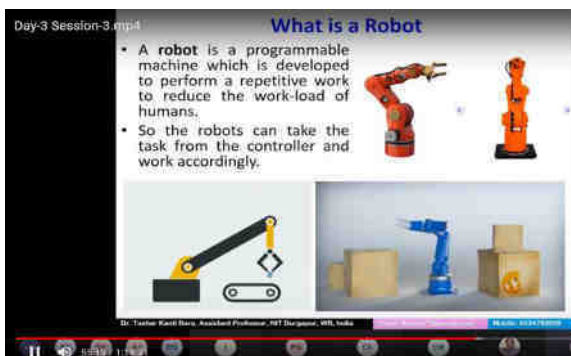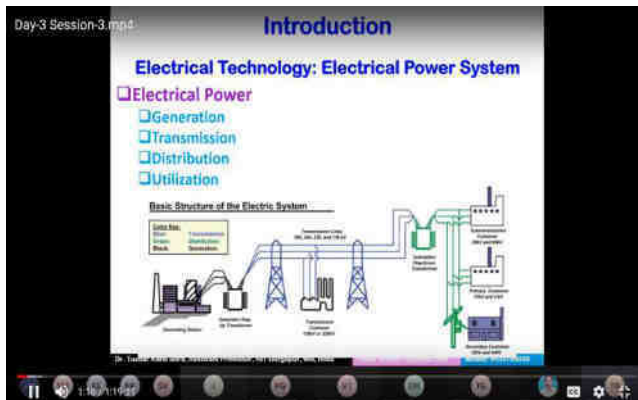Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.
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Day 4: 10ʰ Feb. 2022

Session – 10: An Introduction to Robot Operating System (ROS)

Resource Person: Dr. Raju Halder, Assistant Professor, IIT, Patna, Bihar

Dr. Raju Halder has presented the fundamental aspects of Robot Operating System (RoS) and demonstrated to the participants. During his session, he has several real time applications covering broad aspects of RoS. He has emphasized the impact of reverse to forward engineering approach by displaying some highly commercialized products. Session went on well and participants found it interesting and interaction session also highly appreciable. He has shown some practical applications through programming in RoS.

Presentation by
Dr. Raju Halder,
Assistant Professor, IIT, Patna, Bihar

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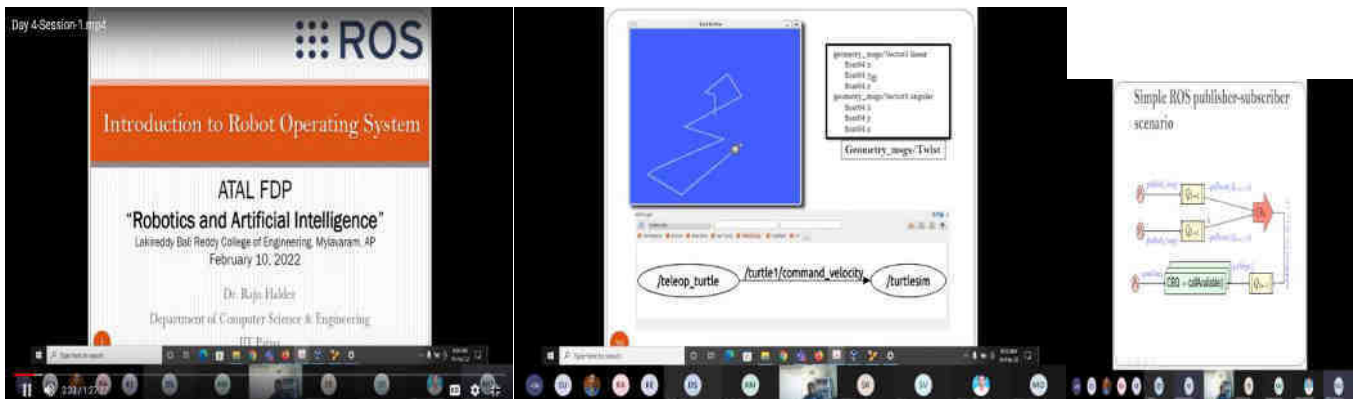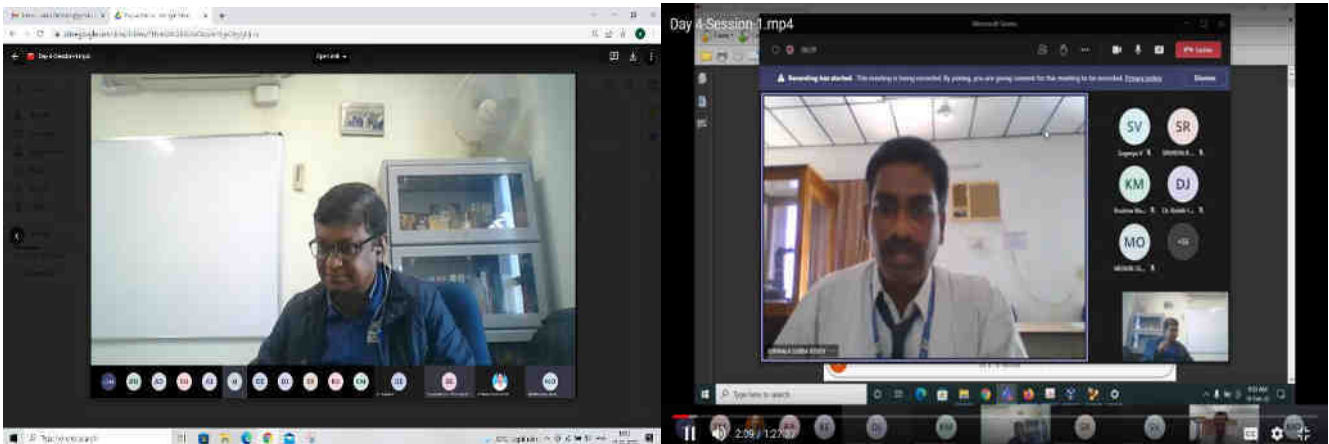Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.
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Day 4: 10ʰ Feb. 2022

Session – 11: The interplay of AI over the Edge, Fog, and the Cloud

Resource Person: Dr. P.S. Sai Krishna, Assistant Professor, Indian Institute of Technology, Tirupati

Dr. P.S. Sai Krishna presented the sessions 11 and 12. He has discussed about edge computing, cloud computing concepts. He discussed about the theoretical part of the Artificial Intelligence over edge, fog and the cloud. He elaborated about Industrial Internet of Things. He has also presented how electric vehicle works and controlling the same.

Presentation by
Dr. P.S. Sai Krishna,
Assistant Professor, Indian Institute of Technology, Tirupati

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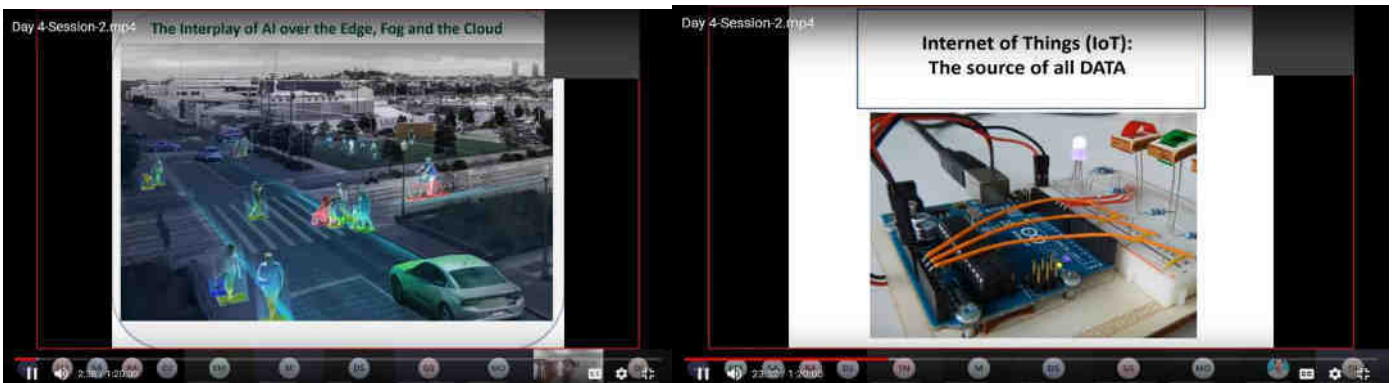Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.
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Day 4: 10ʰ Feb. 2022

Session – 12: Fog and Cloud Robotics

Resource Person: **Dr. P.S. Sai Krishna**, Assistant Professor, Indian Institute of Technology, Tirupati

Dr. P.S. Sai Krishna has presented importance of fog and cloud robotics with suitable examples. He grabbed the attention of the participants with his complete lecture with practical applications. He also explained the difference between fog and cloud robotics. Session went on well, and participants interacted with so many queries. He has also talked about networked cloud robotics. He also emphasized the cloud and visualization of cloud robotics.

Presentation by
Dr. P.S. Sai Krishna,
Assistant Professor, Indian Institute of Technology, Tirupati

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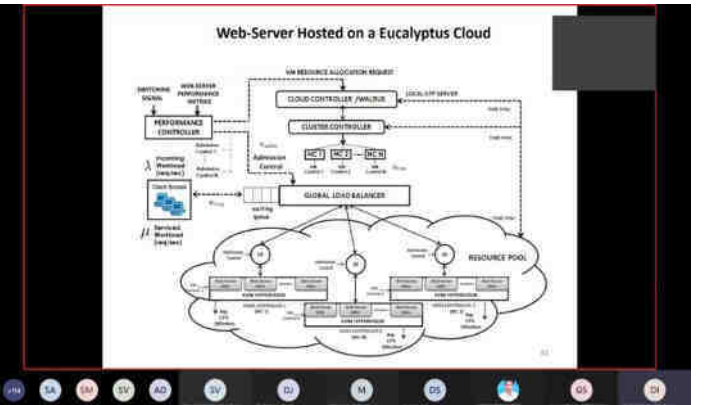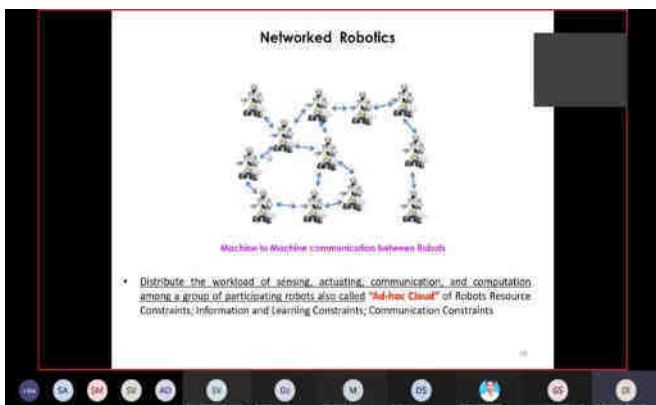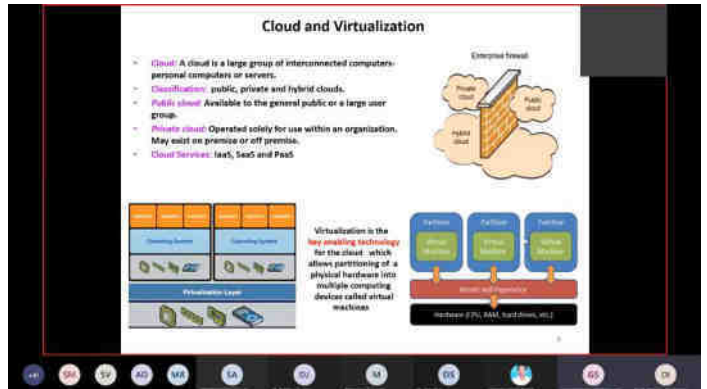Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.
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Day 4: 11ᵗʰ Feb. 2022

Session –13: Deep Learning - Artificial Neural Networks with case studies using Python

Resource Person: Mr. Arunjit Choudary, CEO, EBTS

Mr. Arunjit Choudary has started his session with the introduction to deep learning, artificial neural networks, machine learning concepts. He has given quite good number of real time examples and applications. He also emphasized importance of optimization in designing any robotic system. His session was interactive and discussed optimization techniques at length. During his interaction with the participants, he has informed the services provided by his organization to empower the students with latest technologies.

Presentation by
Mr. Arunjit Choudary, CEO,
EBTS, Pune

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Day 5: 11ʰ Feb. 2022

Session –14: Design and Development of a Glass Façade Cleaning Robot

Resource Person: **Prof. Pushparaj Mani Pathak,** Indian Institute of Technology Roorkee

Prof. Pushparaj Mani Pathak has highlighted the design and development of glass façade cleaning robot. He has given quite good number of real time examples and applications with feasibility to do the soft work while cleaning glass. He also emphasized kinematics and dynamic analysis of the robot. He started the session with design concept, motivation, applications, mechanisms used to design and develop the robot. He has emphasized on the unique design of this robot and applying for patent. During his interaction with the participants, he had discussed the research contribution of IIT Roorkee.

Presentation by
Prof. Pushparaj Mani Pathak,
Professor, Indian Institute of Technology Roorkee

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Day 5: 11ᵗʰ Feb. 2022

Session – 15: Design and BCI based control of hand exoskeletons for rehabilitation of stroke patients

Resource Person: Prof. Ashish Dutta, IIT Kanpur

Prof. Ashish Dutta has completely focused on practical analysis of the hand exoskeleton for rehabilitation of stroke patients with different design criteria. He also highlighted the need and development of products as per the demand of market and its succession possibilities. He has given deep insights on importance of multidisciplinary projects aiming at top-notch devices for societal applications. He has given insights on robot-human interaction, human based design of hand exoskeletons, brain computer interface-based control etc. He has elaborated how to design such applications considering the necessary parameters, and clinical trails for stroke rehabilitation for 8 long years. During his interaction with the participants, he emphasized on open challenges faced during his research. Mechanical design of wearable robots for humans, sensors, understanding recovery after stroke etc were highlighted during his interaction. He also invited the participants to collaborate in future with IIT Kanpur for future research aspects.

Presentation by

Dr. Ashish Dutta,

Professor, Mechanical Engineering, IIT Kanpur

ATAL FDP on "**Robotics and Artificial Intelligence**" 07ᵗʰ Feb 2022 to 11ᵗʰ Feb 2022 organized by Mech Engg Dept, LBRCE

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

L B Reddy Nagar, Mylavarm, Krishna District, Andhra Pradesh-521230
Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi.
Accredited by **NAAC, NBA** Tier-1 for CSE, IT, ECE, EEE & ME and "**CPE**" status by UGC.
Department of Mechanical Engineering

Day 5: 11ʰ Feb. 2022 Valedictory Session – 16

Mrs. B. Udaya Lakshmi, Assistant Professor has welcomed all the dignitaries and delegates. She has started the event as per the program schedule of valedictory function session and introduced dignitaries to the participants.

On the **Valedictory session,** the **Chief Guest** of Valedictory session, **Dr K. Appa Rao,** Principal, LBRCE, AP has emphasized that the outcome of this online ATAL sponsored FDP was excellent and the faculty interactions during this FDP will unleash lot of creative ideas that will contribute technologically for the human and social benefits at large for the growth and development of country. From this FDP it is not enough to learn ideas, it is very important to share the information to all the people, it is very much essential to inspire the people to reach out the interdisciplinary approaches.

ATAL FDP: Robotics and Artificial Intelligence Day-5(11/02/2022): Session-16 -Valedictory Session

Valedictory Speech by Chief Guest
Dr K. Appa Rao, Principal, LBRCE, AP

ATAL FDP on **"Robotics and Artificial Intelligence"** 07ᵗʰ Feb 2022 to 11ᵗʰ Feb 2022 organized by Mech Engg Dept, LBRCE

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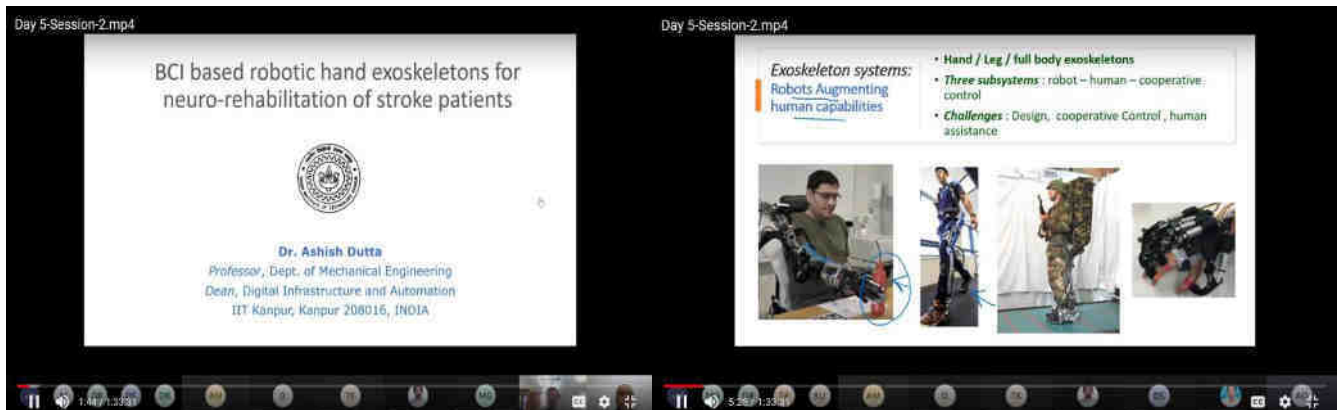## Department of Mechanical Engineering

Mr. Jonnala Subba Reedy, Program Coordinator, Associate Professor MECH highlighted about the program that was conducted very smoothly which was sponsored by AICTE Training and Learning (ATAL) Academy, eminent resource persons from IITs, NITs and Industry. He thanked chief guest for his valuable and inspiring speech. He conveyed gratitude to all the resource persons **Prof. Pandu Ranga Vundavilli,** IIT Bhubaneswar; **Prof. Ekta Singla,** IIT Ropar; **Prof. Santhakumar Mohan,** Indian Institute of Technology (IIT) Palakkad; **Dr. Bharath Kumar,** IIT Tirupati, **Dr. Lalit Singh, Senior Scientist, NPCIL-BARC, Dept. of Atomic Energy, Government of India; Dr. I.A.Palani**, IIT Indore; **Prof. K. Rama Krishna, IIT Delhi; Dr. Tushar Kanti Bera,** National Institute of Technology (NIT) Durgapur; **Prof. Raju Halder,** Indian Institute of Technology Patna; **Dr. P.S. Sai Krishna,** Indian Institute of Technology, Tirupati; **Mr. Arunjit Choudary,** CEO, EBTS, Pune; **Prof. Pushparaj Mani Pathak,** Indian Institute of Technology Roorkee; **Prof. Ashish Dutta,** IIT Kanpur for their gracious presence Inspite of their busy schedule. He has reviewed the programme with his remarks.

He expressed and thanked AICTE Training and Learning Academy (ATAL) to sanction this FDP. He emphasized that the AICTE is intended to develop quality technical education in the country by initiating training through various platforms like SWAYAM, NPTEL, MooC and other platforms along with focusing on yoga activities for health consciousness. It provides training and focusing on the young faculty in the country to enhance their skills and knowledge in their respective areas. Training is required to enrich our knowledge and skills. AICTE has identified several thrust areas which will be focusing on interdisciplinary involvement. **Robotics and Artificial Intelligence** is one of them, which can be focused by all most all the branches of Engineering.

Dr K Appa Rao, Principal thanked all the organizers, participants, and resource persons for making ATAL FDP grand success. He emphasized the importance of robotics and artificial intelligence in design and controlling the robots. He was also expressed gratitude towards AICTE Training and Learning (ATAL) Academy for sanctioning this FDP and expressed gratitude to the management for their kind support in organizing the event successfully. He mentioned that Robotics and AI is one of the challenging areas where lot of research work is going on and expressed that Lot of computations for accuracy, optimization, reliability of robotic systems with AI and other techniques involved in designing robotic systems.

Dr. K. Harinadh Reddy, Vice Principal, gave his remarks on interdisciplinary approach in dealing with engineering problems.

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Co-Coordinators of this FDP, Mr. K.V. Viswanadh, Sr. Assistant Professor; **Mr. V. Venkatrami Reddy**, Assistant Professor have contributed at pre and post activities of this FDP for smooth conduct of this event all the five days**.**

Conveners Dr. S. Pichi Reddy, Professor and HoD of Mechanical Engineering; **Dr. P. Ravindra Kumar**, Professor of Mechanical Engineering have guided and monitored from time to time.

Dr. E. V. Krishna Rao, Professor of ECE, Dean R & D, provided timely suggestions to the organizing team to organize the FDP effectively. He emphasized the need of organizing such FDPs to enhance the skills of faculty and will motivate them to carry out the research.

Dr. M. Srinivas Rao, Professor of CSE, Dean of Academics thanked the ATAL academy for sponsoring this FDP and thanked the management for providing necessary resources.

200 participants registered from various Institutes, Universities, Research Organizations, industries across all parts of India. Almost 140 participants, every session, have participated enthusiastically and interacted with renounced resource persons, from IITs, NITs and Industries, who have had lot of exposure in Robotics & AI were delivered the sessions.

This FDP is a 5-day FDP programme and consists of 15 expert lectures, each of two hrs duration, excluding a session on Stress Management, Research Ethics, Yoga and Meditation. I hope this FDP has provided the essential information and a great opportunity to share our research experience. The researchers might have found new areas where they can work for their research.
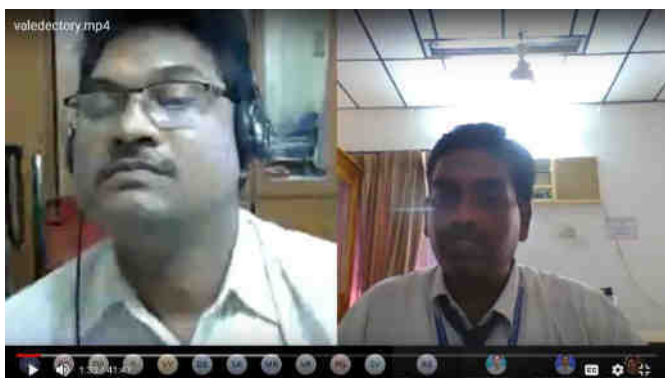
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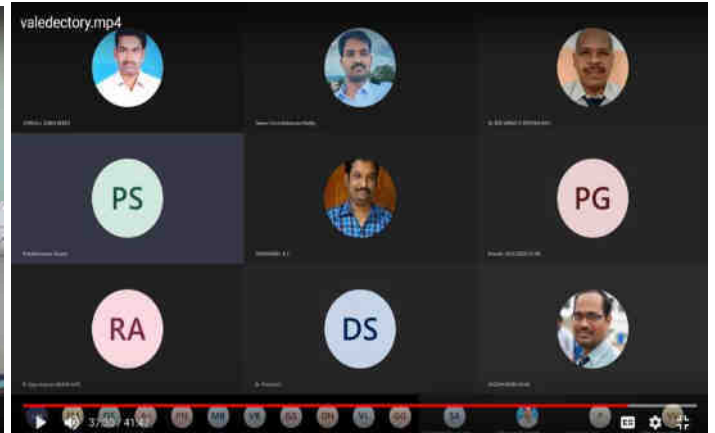
Feedback by Participants in Valedictory Session

The Participants were given very **good feedback** as this FDP was well organized and covered all the contents covering cognitive skills, design thinking approach, entrepreneurship, and patents etc., which requires all the components for getting knowledge of design thinking for engineers.

AICTE is intended to develop quality technical education in the country by initiating training through various platforms like SWAYAM, NPTEL, MooCs and other platforms along with focusing on yoga activities for health consciousness. It provides training and focusing on the young faculty in the country to enhance their skills and knowledge in their respective areas. Training is required to enrich our knowledge and skills. AICTE has identified several thrust areas which will be focusing on interdisciplinary involvement. **Robotics and Artificial Intelligence** is one of them, which can be focused by all most all the branches of Engineering.

At the end valedictory session **vote of thanks** presented by **Mr. K. V. Viswanadh,** Sr. Assistant Professor, LBRCE has paid gratitude towards our **Chief Guest** and expressed the gratitude to all the resource persons, Coordinator, Principal, Head of the department and Management for giving this valuable opportunity for the faculty from various institutions across the country.

Mrs. Udaya Lakshmi, Assistant Professor appreciated all the participants who have attended all five days by sparing their valuable time and acquiring knowledge and concluded the session.

Dept. of Mechanical Engineering
KIDREDDY BALIREDDY COLLEGE OF ENGG
MYLAVARAM 521 230. Krishna Dt

Principal
(Dr K Appa Rao)
PRINCIPAL
Lakireddy Bali Reddy College of Engg.
MYLAVARAM 521 230.

About the Department

The Department of Mechanical Engineering was started in the year 1998. The Department is accredited by NBA (Tier-I). It is recognized as a Research centre by JNTUK Kakinada and has sponsored projects worth of Rs.1.5 crores. Faculty of the department are actively engaged in publishing papers in national and international journals and conferences.

Course Highlights

- This course is designed to provide detail overview of fundamentals of robotic manipulator including modeling methods, kinematics, control and motion planning and its industrial applications.
- Introduction of Robotics and Kinematics and Dynamics of Robots
- Smart materials based Robotic systems
- Robot Dynamics and Control
- Bio - Inspire Robotics
- Localization & Path Planning
- Artificial Intelligence and Robotics
- Underwater Robotics
- Medical Robotics
- Cognitive Robotics
- Humanoid Robotics
- Robotics Operating System (ROS)
- Redundancy Resolution and Energy
- Optimization through Reconfiguration Robotics
- Hands on Training on Microcontroller and Sensors
- Practical session in the course will provide the hands-on practice on prototype robotic manipulator developed in the laboratory.

AICTE Training & Learning (ATAL) Academy

The ATAL academy was established on 24th September 2018 with the objective to plan and help in imparting quality technical education in the country, and to assist technical institutions in advancing research, innovation, and entrepreneurship through training. The Academy stresses upon empowering technical teachers and technicians using Information and Communication Technology. It also aims at utilizing the SWAYAM platform and other resources for the delivery of the training. The academy provides a variety of opportunities for training and exchange of experiences, such as workshops, orientation, learning communities, peer monitoring, and other FDPs.

Important Dates
Last date of online registration: **02nd Feb 2022**
Intimation of participants: **03rd Feb 2022**

Registration
Only online registration of participants to be done through a single webpage
https://atalacademy.aicte-india.org/signup
Signup and register for the programme through the given link.
No registration fee will be charged from the participants.

Who can Apply
Faculty members of AICTE approved institutions, research scholars, PG scholars and participants from Government and Industry (Bureaucrats/Technicians), and faculty/staff of LBRCE, Mylavaram (A.P).

AICTE Training and Learning (ATAL) Academy

**Faculty Development Programme (FDP)
(Online mode)
on
Robotics and Artificial Intelligence**
(07th Feb to 11th Feb 2022)

Chairman
Dr. K. Appa Rao,
Principal, LBRCE, Mylavaram

Convener
Dr. S.Pichi Reddy,
HoD of Mechanical Engineering, LBRCE, Mylavaram

Coordinator
Mr. Jonnala Subba Reddy,
Associate Professor, Department of Mechanical Engineering, LBRCE, Mylavaram

Organized by

**Department of Mechanical Engineering
(Accredited by NBA)**
Lakireddy Bali Reddy College of Engineering, (Autonomous)
Mylavaram, Krishna (Dt), Andhra Pradesh, India

About LBRCE, Mylavaram

The Lakireddy Bali Reddy College of Engineering (LBRCE), Mylavaram was established in the year 1998 by Lakireddy Bali Reddy Charitable Trust, whose architect is Er. Lakireddy Bali Reddy garu. The institute is established with the sole aim of providing high quality educational opportunities in the field of Science, Engineering, Technology and Management. It is spread over 60 acres of sprawling lush green landscape spotted with orchids and grooves. It is approved by AICTE, affiliated to JNTUK, Kakinada and attained Autonomous status in the year 2010. It is accredited with NAAC and NBA (CSE, IT, ECE, EEE & ME) under Tier-I. A separate R&D cell is established in the college to focus on continuous sponsored research. It has various sponsored research projects funded by various funding agencies. At present, 9 B.Tech programmes are offered.

- Aerospace Engineering
- Artificial Intelligence & Data Science
- Artificial Intelligence & Machine Learning
- Civil Engineering
- Computer Science Engineering
- Electrical & Electronics Engineering
- Electronics and Communication Engineering
- Information Technology
- Mechanical Engineering

Four M.Tech programmes and M.B.A programme is offered. The M.Tech Programs are offered in

- Computer Science and Engineering
- Thermal Engineering
- Power Electronics and Drives
- VLSI & Embedded systems

Objective of the Course

The main objective of this course to provide the detailed overview of design, analysis, control and application of Robotics, the future of automation. In the present era, robotics its use much beyond manufacturing and extends to area like e- commerce, logistics, retail, healthcare, disaster management, smart homes and assistive technology among others. The main aim of this FDP is to provide state of the art and recent development in robotics such as manipulators, bipedal locomotion, under water robotics, medical robotics, exoskeletons, Aerial Robotics, COBOTs, and robots for assisted leaving. There would be invited speakers from academic institutes, industries, research laboratories and end users to ignite young minds interested in the field of ROBOTICS. This FDP will be extremely useful for teachers, researchers, industrial personnel who would like to upgrade their skill in this area.

Resource Persons

1) **Dr. Ekta Singla, IIT Ropar**
2) **Dr. Shanthakumar Mohan, IIT Palakkad**
3) **Dr. V. Pandu Ranga, IIT Bhubaneswar**
4) **Dr. P.S. Sai Krishna, IIT Tirupathi**
5) **Dr. Pushparaj Mani Pathak, IIT Roorkee**
6) **Dr. Bharat Kumar, IIT Tirupati**
7) **Dr. Lalith Singh, Sr. Scientist, BARC**
8) **Dr. I. A. Palani, IIT Indore**
9) **Dr. K. Rama Krishna, IIT Delhi**
10) **Dr T. K. Bera, NIT Durgapur**
11) **Dr. Raju Halder, IIT Patna**
12) **Dr. Ashish Dutta, IIT Kanpur**

General Information

- An online test shall be conducted at the end of the program.
- E-certificates will be issued only to those participants who attend the program with a minimum 80% of attendance and score minimum 60% marks in the test.
- Selection of participants will be as per the rules and regulations of ATAL Academy.

COMMITTEE MEMBERS

Chief Patrons
Er. Lakireddy Bali Reddy
Chairman, LBRCE

Sri L. Jaya Prakash Reddy
Co-Chairman, LBRCE

Sri L.R.N.K. Prasad Reddy
Vice-Chairman, LBRCE

Patrons
Sri G. Srinivasa Reddy,
President, LBRCE

Dr. K. Appa Rao, Ph.D
Principal, LBRCE

Dr. K. Harinadha Reddy, Ph. D.
Vice-Principal, LBRCE

Conveners
Dr. S.Pichi Reddy, Ph.D
HOD- ME, LBRCE

Dr. P. Ravindra Kumar, Ph.D.
Professor, ME, LBRCE

Contact Details

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Mobile Number: 9985100936, 8919292437
Email: jonnalasu@lbrce.ac.in

Co-coordinators
Mr.K.V.Viswanadh, Sr. Assistant Professor, Department of Mechanical Engineering,
Mobile Number: 7702893880

Mr. V. Venkatrami Reddy, Assistant Professor, Department of Mechanical Engineering, LBRCE
Mobile Number: 9989460311

SCHEDULE
ATAL sponsored FDP - Feb 07 - 11,2022
Organized by
The Department of Mechanical Engineering (Accredited by NBA),
Lakireddy Bali Reddy College of Engineering (Autonomous), Mylavaram

Date/ Sessions-time	Session-1 [09:15 AM-11:15 AM]	Session-2 [11:15 AM- 01:15 PM]	Session-3 [02:00 PM-04:00 PM]
Feb 7,2022 Monday	**Inauguration:09.15AM – 09.45 AM** **Prof. Pandu Ranga Vundavilli** IIT Bhubaneswar **Introduction to Robotics**	**Prof.EktaSingla, IIT Ropar** **Industrial Robotics Systems: A Journey of Five Decades**	**Prof. Santhakumar Mohan** **Indian Institute of Technology (IIT) Palakkad** **Rehabilitation Robots**
	Session-4 [09:15 AM-11:15 AM]	Session-5 [11:15 AM- 01:15 PM]	Session-6 ** [01.30 PM – 03.30 PM]
Feb 8,2022 Tuesday	**Prof. Pandu Ranga Vundavilli** IIT Bhubaneswar **Biped Robotics**	**Dr. Bharath Kumar** IIT Tirupati **Stress Management and Research Ethics**	**Dr. Lalit Singh, Senior Scientist** **NPCIL-BARC, Dept. of Atomic Energy, Government of India, AI in reliability analysis of safety critical systems**
	Session-7 [09:15 AM-11:15 AM]	Session-8 [11:15 AM- 01:15 PM]	Session-9,10 [02:00 PM-04:00 PM]
Feb 9,2022 Wednesday	**Dr.I.A.Palani** IIT Indore **SoftRobotics**	**Prof. K. Rama Krishna, IIT Delhi** **Kinematics and Dynamics of Cobotic Manipulators**	**Dr. Tushar Kanti Bera** **National Institute of Technology (NIT) DurgapurElectrical Impedance Based Artificial Skins Characterizations for Robotics**
	Session-11 [09:15 AM-11:15 AM]	Session-12 [11:15 AM- 01:15 PM]	Session-13 [02:00 PM-04:00 PM]
Feb 10,2022 Thursday	**Prof. Raju Halder** **Indian Institute of Technology Patna, India** **An Introduction to Robot Operating System (ROS)**	**Dr. P.S. Sai Krishna** **Indian Institute of Technology, Tirupati** **The interplay of AI over the Edge, Fog, and the Cloud**	**Dr. P.S. Sai Krishna** **Indian Institute of Technology, Tirupati** **Fog and Cloud Robotics**
	Session-14 [09:15 AM-11:15 AM]	Session-15 [11:15 AM- 01:15 PM]	FDP Closing [01.30 PM – 03.30 PM]
Feb 11,2022 Friday	**Prof. Pushparaj Mani Pathak** **Indian Institute of Technology Roorkee** **Design and Development of a Glass Façade Cleaning Robot**	**Prof.Ashish Dutta, IIT Kanpur** **Design and BCI based control of hand exoskeletons for rehabilitation of stroke patients**	**Mr. Arunjit Choudary, CEO, EBTS** **Deep Learning - Artificial Neural Networks with case studies using Python** **Test, feedback and closing ceremony (starts from 03.30 PM)**

** Yoga and Meditation Session (3.30PM to 4.30 PM on 8th Feb 2022)