

6.2.1 Records showing Deployment of Strategic Plan Academic Years 2023-24

Index

Sr. No.	Goal Strategy	Metrics	Documents
1	UG Edu. Strategy 4	NBA accreditation for all Departments by 2023	1. NBA Accreditation Certificate 2023-24
2	PG Edu. & Research Strategy 1	Advance research and scholarly enterprise.	1. Research Paper publish by PG 2023-24 2. Research Paper Publish by PhD scholar 2023-24 3. Research Project undertaken for 2023-24
3	PG Edu. & Research Strategy 2	Initiate research culture In D.V.V.P College of Engineering Students	1. Arrangement of Technical Event promoting research culture amongst PG & PhD scholar. (Report on International Conference ICAMS 2023-24) 2. Patent
4	PG Edu. & Research Strategy 3	Improve research synergies with Industry.	1. MoU between Institute and Industry to promote research.
5	PG Edu. & Research Strategy 4	Advance the reputation of research and PG programs in industry	1. PG/PhD scholar research collaboration with Industry.
6	PG Edu. & Research Strategy 5	Obtain AICTE/DST/BCUD grants from government sources	1. AICTE/DST/BCUD Grants received during 2023-24.

UG Education Strategy- 4

1. NBA Accreditation Certificate 2023-24

राष्ट्रीय प्रत्यायन बोर्ड

चौथा तल, ईस्ट टावर, एन. बी. सी. प्लेस, भीष्म पितामह मार्ग, प्रगति विहार, लोधी रोड, नई दिल्ली -110003
NATIONAL BOARD OF ACCREDITATION
4th Floor, East Tower, NBCC Place, Bisham Pitamah Marg, Pragati Vihar, Lodhi Road, New Delhi 110003



File No: 28-621-2020-NBA

Date: May 30, 2023

To,

The Principal,
Dr. Vithalrao Vikhe Patil College of Engineering,
Ahmednagar, PO: MIDC, Vilad Ghat,
Ahmednagar, Maharashtra – 414111.

Subject: Accreditation status of UG Engineering programs applied by Dr. Vithalrao Vikhe Patil College of Engineering, Ahmednagar, PO: MIDC, Vilad Ghat, Ahmednagar, Maharashtra – 414111.

Sir,

This has reference to your application I.D. No. 5004-29/09/2020 seeking accreditation by National Board of Accreditation to UG Engineering programs offered by **Dr. Vithalrao Vikhe Patil College of Engineering, Ahmednagar, PO: MIDC, Vilad Ghat, Ahmednagar, Maharashtra – 414111.**

2. An Expert Team conducted onsite evaluation of the programs from **03rd to 05th March, 2023**. The report submitted by the Expert Team was considered by the concerned Committees constituted for the purpose in NBA. The Competent Authority in NBA has approved the following accreditation status to the programs as given in the table below:

Sl. No.	Name of the Program(s) (UG)	Basis of Evaluation	Accreditation Status	Period of validity	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
1.	Civil Engineering	Tier II June 2015 Document	Accredited (614 Marks awarded by the Visiting Team revised to 629 as per the observations made and indicated in the Annexure to this letter)	Academic Years 2023-2024 to 2025-2026 i.e. upto 30-06-2026	Accreditation status granted is valid for the period indicated in Col.5 or till the program has the approval of the Competent Authority, whichever is earlier
2.	Electronics and Telecommunication Engineering		Accredited (619 Marks awarded by the Visiting Team revised to 608 as per the observations made and indicated in the Annexure to this letter)		

3. It may be noted that only students who graduate during the validity period of accreditation, will be deemed to have graduated with an NBA accredited degree.

4. The programs have been granted accreditation for 3 years. **Dr. Vithalrao Vikhe Patil College of Engineering, Ahmednagar, PO: MIDC, Vilad Ghat, Ahmednagar, Maharashtra – 414111** should submit the Compliance Report at least six months before the expiry of validity of accreditation mentioned above so as to be eligible for consideration by the concerned Committee in NBA for further processing of the accreditation status.



-2-

5. The accreditation status awarded to the programs as indicated in the above table does not imply that the accreditation has been granted to **Dr. Vithalrao Vikhe Patil College of Engineering, Ahmednagar, PO: MIDC, Vilad Ghat, Ahmednagar, Maharashtra – 414111** as a whole. **As such the Institution should nowhere along with its name including on its letter head etc. write that it is accredited by NBA because it is program accreditation and not Institution accreditation. If such an instance comes to NBA's notice, this will be viewed seriously.** Complete name of the program(s) accredited, level of program(s) and the period of validity of accreditation, as well as the Academic Year from which the accreditation is effective should be mentioned unambiguously whenever and wherever it is required to indicate the status of accreditation by NBA.
6. The accreditation status of the above programs is subject to change on periodic review, if needed by the NBA. It is desired that the relevant information in respect of accredited programs as indicated in the table in paragraph 2, appears on the website and information bulletin of the Institute.
7. The accreditation status awarded to the programs as indicated in table in paragraph 2 above is subject to maintenance of the current standards during the period of accreditation. If there are any changes in the status (major changes of faculty strength, organizational structure etc.), the same are required to be communicated to the NBA, with an appropriate explanatory note.
8. A copy each of the Report of Chairman of the Visiting Team and Evaluators' Reports in respect of the above programs is enclosed.
9. If the Institute is not satisfied with the decision of NBA, it may appeal within thirty days of receipt of this communication giving reasons for the same and by paying the requisite fee.

Yours faithfully,



(Dr. Anil Kumar Nassa)
Member Secretary

- Encls.: 1. Copy of Report of Chairman of the Visiting Team.
2. Copy each of Expert Reports of the Visiting Team.

Copy to:

1. The Director,
Directorate of Technical Education
Govt. of Maharashtra 3,
Mahapalika Marg,
Mumbai 400 001.
2. The Registrar,
Savitribai Phule Pune University,
Ganeshkhind Road, Pune,
Maharashtra 411007.
3. Accreditation file
4. Master Accreditation file of the State

ANNEXURE

**Dr. Vithalrao Vikhe Patil College of Engineering,
Ahmednagar, PO: MIDC, Vilad Ghat,
Ahmednagar, Maharashtra – 414111**

Name of Program (UG)	Observations
Civil Engineering	Marks are recalculated as per formula in criterion 5 in Faculty Cadre & Faculty Retention
Electronics and Telecommunication Engineering	Marks are recalculated as per formula in criterion 5 in SFR & Faculty Retention

Chunilal

PG Education & Research Strategy 1

1. Research Paper publish by PG 2023-24

Sr. No.	Name of Student	Paper Title	Journal	ISSN/ISBN	Publication Year
1	Tanpure Harshada Ashok	Seismic Analysis of Structure Using Friction Damper	IJIRT, Volume 10 Issue 11	2349-6002	Apr-24
2	Jadhav Riteeka Sandeep	Effect of Varying Molarity and Temperature on Geopolymer Concrete	IJIRT, Volume 10 Issue 11	2349-6002	Apr-24
3	Joshi Shreeya Vaibhav	Dynamic and Vibration Analysis of Foot Over Bridge with Various Frequencies Due To Human Walking By Using Staadpro: A Review	IRJET, Volume: 11 Issue: 04	2395-0056	Apr-24
4	Kharade Suraj Sandeep	Experimental Study on Effect of Glass Fiber on Replacement of Cement by Fly Ash	IJIRT, Volume 10 Issue 11	2349-6002	Apr-24
5	Dahatonde Nihal Pradip	DESIGN AND ANALYSIS OF VOIDED DECK SLAB	Volume 12, Issue 4	2320-2882	Apr-24
6	Fakir Sahilsha Raju	Production of Pervious Concrete Using Waste Rubber Crumbs as A Partial Replacement of Coarse Aggregate	Volume 10, Issue 7	2349-6002	Dec-23
7	Gangarde Shreepad Madhukar	Behavior Of Pavement Pervious Concrete for Partial Replacement of Cement with Ground Granulated Blast-Furnace Slag (GGBS)	IJIRT, Volume 10 Issue 11	2349-6002	Apr-24
8	Gosavi Nikhil Nandkumar	Production of Pervious Concrete Using Waste Rubber Crumbs as A Partial Replacement of Coarse Aggregate	Volume 10, Issue 7	2349-6002	Dec-23
9	Nishant Chavan	Vibration Analysis of Wheel Rim	IJASRET, Volume 08 Issue 05	2456-0774	May-24
10	Rita Badadhe	Design and Topological Optimization of an Internal	IJIERT, Volume 10 Issue 11	2394-3696	Nov-23

		Combustion Engine Piston			
11	Sahil SanjeevKumar Doshi	Multi Objective Optimization of Flexure Bearing	IJSREM, Volume: 08 Issue: 04	2582-3930	Apr-24

2. Research Paper Publish by PhD scholar 2023-24

Sr. No.	Name of Student	Paper Title	Journal	ISSN/ISBN	Publication Year
1.	Kale K Markad K, Patekar V.	Structural analysis of Nano- filler based Structural Composite	Journal of Aeronautical Materials	<u>1005-5053</u>	2023
2	Markad Kanif, Patekar Vivek*, Kale Kishor	Experimental and numerical investigation of nanomaterial-based structural composite	Curved and Layered Structures	2353-7396	2023

3. Research Project undertaken for 2023-24

Sr. No.	Name of Student	Title of Research Project	Publication Year
1	Yogesh Ramrao Gunjal	Experimental Investigation into Assisted Heating and Cooling Approach in FSW Of Steel To Aluminum	2023-24
2	Deepak Sadashiv Pawar	Development of Fungi Based Bio Degradable Materials for Engineering Applications	2023-24
3	Narayan Sahadu Khemnar	Experimental Investigation into Dissimilar Metal Lap Joining using Friction Stir Scribe Technique.	2023-24
4	Kadam Kaveri Somnath	Development of Bio Absorbable Implant Materials	2023-24
5	Dattatray Karbhari Nannaware	Joining of Dissimilar Metals using Friction Welding	2023-24
6	Rahul Ashok Kandake	Optimization of Fused Filament Fabricated Auxetic Structure using Machine Learning	2023-24
7	Supriya Ravindra Tambe	Application of Machine Learning to Optimize Chiral Structure Manufactured by Fused Decomposition Modeling	2023-24
8	Praveen Gowardhan Kohak	Process Parameter Optimization Fused Decomposition Modelled Maetamaterials using Artificial Intelligence.	2023-24

PG Education & Research Strategy 2

1. Technical Event has been organized by the department of Mechanical Engineering to promote research culture.

Report on International Conference ICAMS 2023-24

Department of Mechanical Engineering

Report on Conference Organized

Date: 15/05/2023

Name of Event	Conference (Online Mode)	Date of Conduction	9th - 10th May, 2023
Organizer	Dr Vithalrao Vikhe Patil COE's, Department of Mechanical Engineering		
In Association with	1. Technology Research and Innovation Centre, India, 2. Academy of Nanotechnology and WasteWater Innovations, Johannesburg, South Africa 3. IEEE Nanotechnology Council Chapter, South Africa, 4. College of Engineering, Covenant University, Ota		
Title	3rd International Conference on Advances in Material Science 2023		
Time	11:00 am to 04.30 pm	No. of Participants	44
Expert Name	— (Given in the schedule)		
Designation	—		
Organization	—		

Summary:

The 3rd International Conference on Advances in Material Science 2023 likely covered recent developments and innovations in the field of materials science.

Conferences like this typically explore advancements in various material types, including metals, polymers, ceramics, and nanomaterials. Topics often include:

- Cutting-edge research in material properties and applications.
- Sustainable and eco-friendly materials.
- Smart materials and their uses in technology.

- The impact of advanced materials in industries such as healthcare, energy, and electronics.
- Challenges in manufacturing and material processing techniques.

Keynotes, paper presentations, and workshops usually offer insights into experimental methods, computational modeling, and material characterization. Networking among professionals, researchers, and students would also be an essential aspect.

Received **104 abstracts** from **17 Countries** such as Algeria, Chile, China, France, India, Iraq, Morocco, Nigeria, Oman, Poland, Portugal, Russia, South Africa, Thailand, VietNam, Indonesia, Philippines and contributed by **more than 250 authors**.

44 abstract Accepted for oral presentation these papers are going to be presented during 06 Sessions on 09-10 May 2023.

The peer reviewed, accepted papers will be published in Key Engineering Materials and other journals published by Trans Tech Publications.

Brochure:



ICAMS 2023 Statics:

3rd International Conference on Advances in Material Science 2023

09-10 May 2023 (ONLINE)

Conference Statistics

3rd International Conference on Advances in Material Science 2023 is organized by.,

- Dr. Vithalrao Vikhe Patil College of Engineering, Vilad Ghat, Ahmednagar
- Technology Research and Innovation Centre, India,
- Academy of Nanotechnology and Waste Water Innovations, Johannesburg, South Africa
- IEEE Nanotechnology Council Chapter, South Africa,
- College of Engineering, Covenant University, Ota and

Received **104 abstracts** from **17 Countries** such as Algeria, Chile, China, France, India, Iraq, Morocco, Nigeria, Oman, Poland, Portugal, Russia, South Africa, Thailand, VietNam, Indonesia, Philippines and contributed by **more than 250 authors**.


39 abstract Accepted for oral presentation these papers are going to be presented during 06 Sessions on 09-10 May 2023.

The peer reviewed, accepted papers will be published in Key Engineering Materials and other journals published by Trans Tech Publications.

Guests available During the Inaugural Function

- **Prof. Sunil K. Kalhapure** Dy. Director Technical, DVVP Foundation, Ahmednagar
- Hon .Lt. Gen. **Dr. B. Sadananda**, Academic Advisor, DVVP Foundation, Ahmednagar
- **Mr. Subhranshu Panda**, Technical Director, Hoganas India, Ahmednagar
- **Prof. (Dr.) Uday P. Naik** Principal, Dr.Vithalrao Vikhe Patil College of Engineering, Ahmednagar, Maharashtra, India
- **Dr. Sunday O. Oyedepo**: Mechanical Engineering Department, College of Engineering, Covenant University, Ota, Nigeria
- **Dr. P.A. Patil, Member**, Board of Studies, Mechanical Engineering, Savitribai Phule Pune University, Pune.
- **Dr. Sandip A. Kale**, Director, Technology Research and Innovation Centre, India
- **Dr. K.B. Kale**, Convener, ICAMS 2023
- **Dr R.R. Navthar**, HOD Mechanical Engineering, Dr.VithalraoVikhePatil College of Engineering, Ahmednagar, Maharashtra, India




PRINCIPAL
Dr. Vithalrao Vikhe Patil
College of Engineering
Ahmednagar


Prof. (Dr) R. R. Navthar

Schedule:

3rd International Conference on Advances in Material Science 2023

09-10 May 2023 (ONLINE)

Full Conference Schedule

(Indian Standard Time)

Date & Day	Activity	Time (Indian Standard Time)	Google Meet Link
09 May 2023 Tuesday	Inauguration	11.00 am to 12.00 pm	https://meet.google.com/xyg-myjm-ora
	Session 1	12.00 pm to 01.30 pm	https://meet.google.com/xjp-jmzg-fec
	Session 2	01.30 pm to 03.00 pm	https://meet.google.com/ixv-ofmm-fdg
	Session 3	03.00 pm to 04.30 pm	https://meet.google.com/cba-niso-eib
10 May 2023 Wednesday	Session 4	11.00 am to 12.30 pm	https://meet.google.com/fba-pfvo-nwo
	Session 5	12.30pm to 02.00 pm	https://meet.google.com/uxm-lyzt-kuw
	Session 6	02.00 pm to 03.30 pm	https://meet.google.com/jab-dhop-aog

All Authors are requested to attend the Inauguration Function and sessions as per above schedule.

For any other queries contact us at info.icams@gmail.com

3rd International Conference on Advances in Material Science 2023
Paper Presentation Schedule

Day 01: 09 May 2023, Tuesday (ONLINE)(Indian Standard Time)

Session	Paper Title	Authors	
1	Change in Concrete Properties Due to Fire	Bhaskar Bhatt	1.
	Stabilization Of Black Cotton Soil Using Sand, Sodium Hydroxide And Fly Ash	KhamarMadihaAfnan, DurgaChaitanya Kumar Jagarapu, Dr. Syed HamimJeelani, ArunakanthiEluru	2.
	Experimental investigation on polyethylene terephthalate (pet) concrete	Ajay S T P, DurgaChaitanya Kumar Jagarapu, ArunakanthiEluru	3.
	Slugless Jet with Bimetallic Lined Shaped charge	Santosh N Ingole, M J Rathod	4.
2	Role of catalyst and it's concentration on the production of green energy from metal waste	Kanakasabai P, Rajasekaran R, Saikat B, Sivamani S.	5.
	Prediction of basic density in Pterocarpusdalbergioides wood by non destructive near infrared spectroscopy technique	M S Deepa	6.
	Tensile and flexural strength of hybrid PLA/Basalt biocomposite	Mirza Faizaan, Satish B. Shenoy, Chandrakant R. Kini	7.
	Multiple Regression Analysis For Optimization Of Inulin Production From Chicory Roots	Kanakasabai P, Sivamani S, Saikat, B.	8.
3	Welding of different stainless steel using Gas Tungsten Arc Welding technique and its characterisation - A Review	JebinThankachan Philip , Sudhish R	9.
	Comparison of Static and Dynamic Test Results of Al 6061 Material Subjected To Severe Plastic Deformation.	BurakBahat, GuvenGuneyYapici	10.
	Emerging trends in Copper Sulphide (CuS) & its conjugates-based supercapacitors	DeyAkashdeep, NoyelVictoria S., GaikwadMahendra	11.
	Crystallinity Study of Electrodeposited SnO ₂ on FTO	UddipanAgasti, SamitKarmakar, Soumik Kumar Kundu, Mili Sarkar, Sayan Chatterjee	12.
	Influence of Grain Size and Friction Conditions on Fretting-Wear of Commercial Pure Titanium	Stolyarov Vladimir	13.

Day 02: 10 May 2023, Wednesday (ONLINE)(Indian Standard Time)

Session	Paper Title	Authors	
4	Adsorption study of 2, 4-Dichlorophenoxyacetic Acid removal using a polypyrrole-activated carbon composite	Sridevi H, Raja Selvaraj, RamanandaBhat M	14.
	Poly(O-PhenyleneDiamine) reformed Pencil Graphite as the disposable electrochemical sensor for voltammetric analysis of tryptamine	Aswathy S Murali , Chippy Harish, Sherin Susan Cherian, Gayathri S Nair, Lekshmi S K, Surya Gopidas, BeenaSaraswathyamma	15.
	Dynamic Mechanical Analysis of Graphene Oxide/ Low Density Polyethylene Nanocomposite	Neena.P& P. Predeep	16.
	Experimental and Numerical investigation on effect of cut-outs on Modal parameters of epoxy/glass composite	Shashank N, Ranjan M, Shraddha A, Shashank P, Ramesh S Sharma	17.
	Molecular Property Prediction using YOLO5 and Convolutional Neural Network Machine Learning Algorithm	Ryan S. Evangelista, Patrick D. Cerna, Cromwell M. Castillo, Keno C. Piad, Remedios Ado, Ma. Magdalena V. Gatdula	18.
	A Review on Application of Machine Learning in Fused Deposition Modeling	TambeSupriyaRavindra, NavtharRavindraRambhau	19.
5	Nitric Oxide Gas Sensing By Gold Nanoparticles Decorated Zinc Oxide Nanorods	Dulal Chandra Patra, NitumoniDeka, Anabadya Dash, Suvra Prakash Mondal	20.
	Effect of Zinc Oxide (ZnO) Nanoparticles on Electrical Characterization of Malachite Green (MG) Dye Based Organic Device	SudiptaSen, ArnabKanti Karan, DipankarSahoo, NabinBaranManik	21.
	Screen printed ultra-flexible supercapacitor based on Zeoliticimidazolate framework derived Co ₃ O ₄ and Graphite Nanocomposite	Mohammad Saquib, Sudhakar Y.N, M. Selvakumar	22.
	Experimental Investigation of Nano-material based Structural Composite	VivekPatekar, Kishor Kale, KanifMarkad	23.
	Thermoresponsive PNIPAM based nanocellulose reinforced composite hydrogels	RohitGoyal, SangeetaSahu, SantanuMitra, BimleshLochab	24.
6	Solid particle erosion wear behavior of barium titanate (BT)-calcium copper titanate (CCTO) ceramic polymer composites	Ajit Kumar Behera, Punyapriya Mishra, Punyatoya Mishra	25.
	Effect of Gd content on the microstructures and corrosion properties of Mg-4Zn-3Gd alloy	MitaKhanam, HMMA Rashed	26.
	Effects of Sn on Corrosion Resistance of Rare-Earth-Free Mg-2Zn Alloy	Aniqatasmim, Chanchal Kumar Roy, HMMA Rashed	27.
	Physical materials science of the Fe-TM1-Nd-REM-TM2-B alloys obtained by quenching from the liquid state by spraying the melt with an inert gas flow of medium pressure.	SavinValeriy, MarukhinArtem And SavinaLiudmila	28.

Instructions for paper presentation

- ❖ Paper presentation is mandatory for all papers.
- ❖ Non presented papers will not be considered in the further publication process.
- ❖ Each paper will have 12 minutes for presentation and 3 minutes for Question and Answers.
- ❖ Best paper will be declared for Each Session. Hence, authors are requested to present their work in a detail and better manner.
- ❖ The Google Meet link will be shared soon

- ❖ All authors are requested to join the meeting 5 minutes before the session and not to leave the session in between as much possible.
- ❖ Authors are requested to mute their video and audio, except the presenting authors. They can unmute the mic during Q & A.
- ❖ Any author / co-author can present the paper. The session can be attended by all authors. The answers during Q & A can be given by any author.
- ❖ The conference certificate will include names of all authors

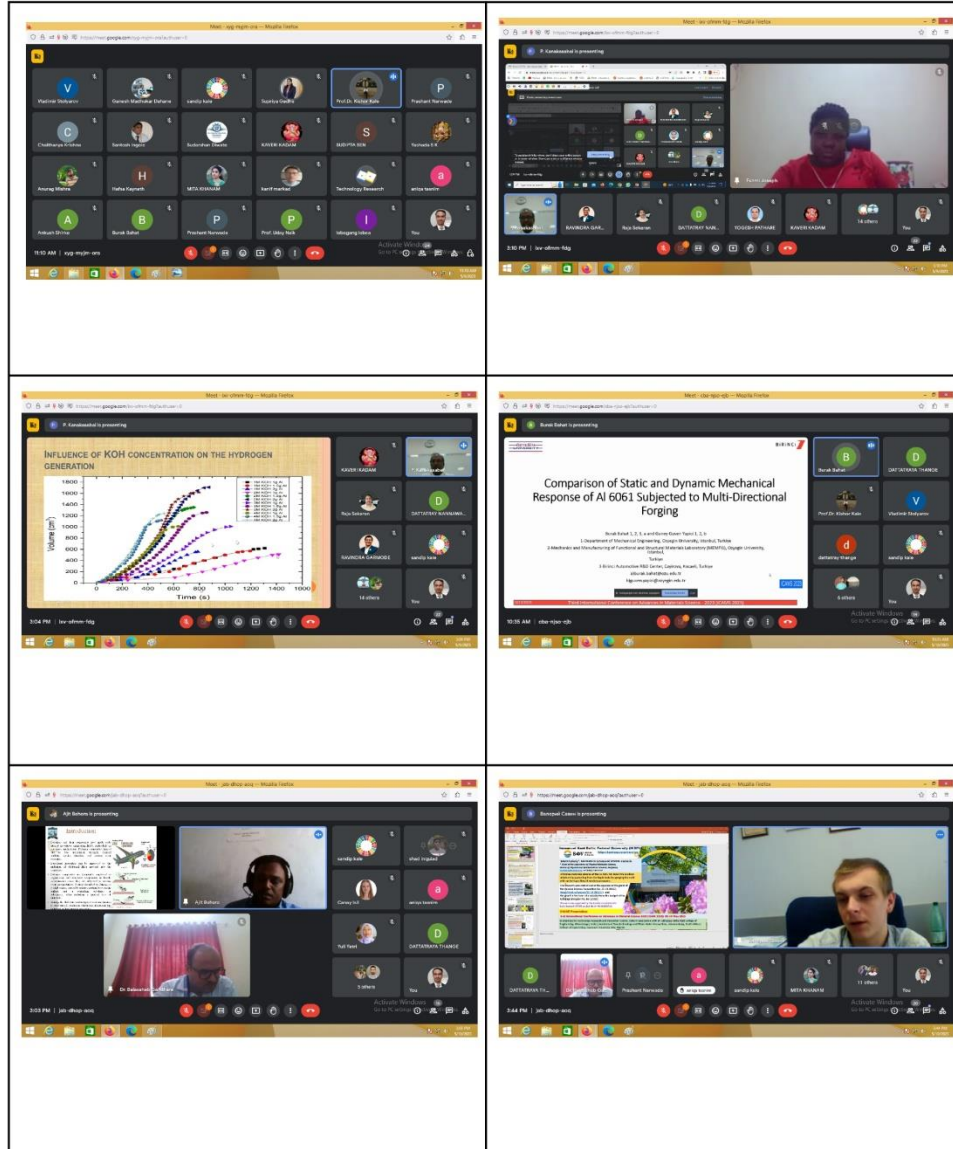


Prof. (Dr) R. R. Navthar




PRINCIPAL
Dr. Vithalrao Vikhe Patil
College of Engineering
Ahmednagar

Photograph/Screenshots of event:



News:

डॉ. विखे पाटील अभियांत्रिकी महाविद्यालयात आज, उद्या आंतरराष्ट्रीय ऑनलाईन परिषद

खेळांच्या
मह

नगरी दवंडी/प्रतिनिधी
अहमदनगर : विळद
घाट येथील डॉ. विठ्ठलराव
विखे पाटील अभियांत्रिकी
महाविद्यालयात डॉ. विठ्ठलराव
मटेरियल सायन्स या विषयाच्या
अंतर्गत तिसऱ्या आंतरराष्ट्रीय
परिषदेचे ऑनलाईन आयोजन
करण्यात आले असून
मंगळवार व बुधवार दोन
दिवस ही परिषद होणार
आहे. अशी माहिती प्राचार्य
डॉ. उदय नाईक यांनी दिली.
या आंतरराष्ट्रीय ऑनलाईन
परिषदेचे डॉ. विखे पाटील
अभियांत्रिकी महाविद्यालय
आणि टेक्नॉलॉजी रिसर्च अँड
इनोवेशन सेंटर अर्कडमी ऑफ
नॅनो टेक्नॉलॉजी अँड वेस्ट

वॉटर इनोव्हेशन जोहान्सबर्ग
साउथ आफ्रिका आणि
कॉलेज ऑफ इंजीनियरिंग
कोवेनंट युनिव्हर्सिटी ओटा
नायजेरिया यांच्या संयुक्त
विद्यमाने मटेरियल सायन्स
या विषयाच्या आंतरराष्ट्रीय
परिषदेचे आयोजन केले आहे.
या परिषदेत ऑनलाईनच्या
माध्यमातून मटेरियल सायन्स
या विषयात होत असलेल्या
अत्याधुनिक संशोधना
संदर्भात विविध असे सुमारे
५० शोधनिबंधांचे सादरीकरण
होणार आहे हे शोधनिबंध १७
देशांमधून प्राप्त झाले आहेत.
या मध्ये अल्जेरिया, चिली,
चीन, फ्रान्स, इंडिया, इराक,
मोरक्को, नायजेरिया, ओमान,

पोलंड, पोर्तुगीज, रशिया,
साऊथ आफ्रिका, थायलंड,
व्हिएतनाम, इंडोनेशिया आणि
फिलिपाईन्स या देशांचा
समावेश आहे. मटेरियल
सायन्स या विषयांमध्ये सध्या
होत असलेल्या संशोधना
संदर्भात आधुनिक बाबींचा
उहापोह करण्यात येणार
आहे. या परिषदेचे उद्घाटन
डॉ. विखे पाटील फाउंडेशन
चे जनरल सेक्रेटरी डॉ. पी
.एम. गायकवाड उपसंचालक
श्री. सुनील कल्हापूरे,
प्राचार्य डॉक्टर उदय नाईक
हे उपस्थित राहणार आहेत.
या परिषदेत जगभरातील
विविध विद्यापीठातील
शैक्षणिक तज्ञ सहभागी होण-

ार असून डॉ. शुभांशू पांडा,
डॉ. संदीप काळे, डॉ. अजय
मिश्रा, डॉ. संडे ओये डेपो डॉ.
के. बी. काळे हे मार्गदर्शन
करून सहभाग नोंदविणार
आहे. या आंतरराष्ट्रीय
ऑनलाईन परिषदेचे आयोजन
यंत्र अभियांत्रिकी विभाग
प्रमुख डॉ. रविंद्र नवथर
तसेच प्राध्यापक, शिक्षकवृंद
आदींनी केले आहे.
या आंतरराष्ट्रीय ऑनलाईन
परिषदेत सहभागी संशोधकांना
भावी वाटचालीस संस्थेचे
अध्यक्ष ना. राधाकृष्ण
विखे पाटील मुख्यकार्यकारी
अधिकारी खा. डॉ. सुजय
विखे पाटील यांनी शुभेच्छा
दिल्या आहेत.


नगरी द
अहमद
आहे. समा
महणून भव्य
आहे. आज
खेळांच्या म
निर्माण कर
दिले आहे,
नगर श
२०२३फ भ
आमदार सं
करण्यात अ
कदम, नगर
जाधव, किश
मंचे, दत्तात्रय
प्रमोद गुंडे,
रुपाली बोड
मंगलारप, सं
महेंद्र कवडे,
म्याना, सुभा

गुंडेगावच्या भैरवनाथ यात्रेत रंगला जंगी कुस्त्यांचा आस्वाडा

Organized by:

Name of the Club	—
Name of the Faculty	Dr. R.R. Navthar




PRINCIPAL
Dr. Vithalrao Vikhe Patil
College of Engineering
Ahmednagar

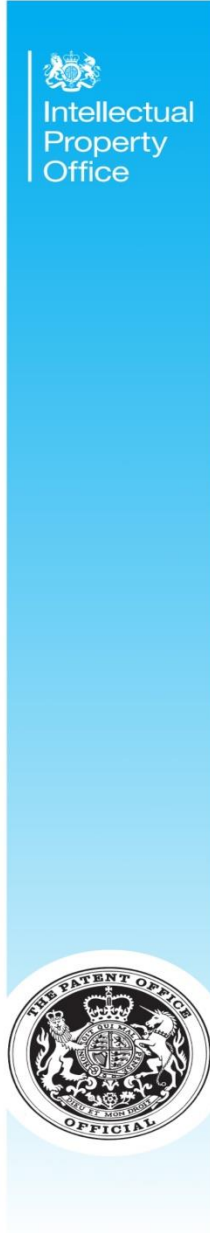

HOD

Dr. R.R. Navthar
Mechanical Engineering

2. Patent

Phd Scholar Prof. Milind Mhaske & Guide Dr. R.R. Navthar has registered for a UK Design for
“Solar Power Charging Station for Vehicles” Year 2023.

Certificate:



Certificate of Registration for a UK Design

Design number: 6295210

Grant date: 17 July 2023

Registration date: 08 July 2023

This is to certify that,

in pursuance of and subject to the provision of Registered Designs Act 1949, the design of which a representation or specimen is attached, had been registered as of the date of registration shown above in the name of

Dr. Mahesh Purushottam Nagarkar, Dr. Navthar Ravindra Rambhau, Amol

Dnyaneshwar Wable , Dr. Vaibhav Jalindar Hase, Dr. Vilas Sheshrao Ubale ,

Rahul Nandkumar Zaware, Sonam Mahendra Gujrathi, Ranjit Vasant Rajale,

Digambardas Dnyandeo Desale , Dr. Mhaske Milind Shivram

in respect of the application of such design to:

Solar Power Charging Station for Vehicles

International Design Classification:

Version: 14-2023

Class: 13 EQUIPMENT FOR PRODUCTION, DISTRIBUTION OR

TRANSFORMATION OF ELECTRICITY

Subclass: 04 SOLAR EQUIPMENT

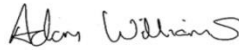
Version: 14-2023

Class: 13 EQUIPMENT FOR PRODUCTION, DISTRIBUTION OR

TRANSFORMATION OF ELECTRICITY

Subclass: 03 EQUIPMENT FOR DISTRIBUTION OR CONTROL OF ELECTRIC

POWER



Adam Williams

Comptroller-General of Patents, Designs and Trade Marks

Intellectual Property Office

The attention of the Proprietor(s) is drawn to the important notes overleaf.

PG Education & Research Strategy 3

1. Memorandum of Understanding between Institute and Industry to promote research. Year 203-24


Sr. No.	Data	Link
1	Memorandum of Understanding data is upload in point 3.5.2	https://docs.google.com/spreadsheets/d/1R9JZ1E1991uFLl88k_HgEqRbIRro9f-a/edit?gid=1151536899#gid=1151536899

PG Education & Research Strategy 4


1. PG/PhD scholar research collaboration with Industry Year 2023-24.

Sr. No.	Name of the Research Scholar	Research project Title	Industry	Year
1	Dattatray K. Nannaware	Joining of Dissimilar Metals using Friction Welding	EATON Industrial Systems Pvt. Ltd. MIDC, Nagapur, Ahilya Nagar, Maharashtra 414111	2023-24

Documents:



॥ न हि ज्ञानेन सदृशं पवित्रमिह विद्यते ॥
Dr. Vithalrao Vikhe Patil Foundation's
Dr. Vithalrao Vikhe Patil College of Engineering
Affiliated to SPPU, Pune (ID No. PU/AN/Engg./027/(1983)
Recognized by AICTE, New Delhi & Government of Maharashtra
Accredited by NAAC with A+ Grade (3.34 CGPA) & NBA, New Delhi



Ref.No. CEA/Mech/Th.D work/2024/ 204 Date:- 23/1/2024

To,
The H.R. Manager,
M/s. EATON Pvt. Ltd.,
MIDC, Ahmednagar

Sub:- Permission to prepare sample on Friction Welding Machine


Dear Sir,


We are from Dr. Vithalrao Vikhe Patil College of Engineering, Vilad Ghat, Ahmednagar. Our institute is affiliated to Savitribai Phule Pune University, Pune. As per the previous discussion with you by Prof. D.K.Nannaware, Mech.Engg. & your colleague regarding Ph.D. Research work preparation of sample on Friction Welding Machine in your esteemed organization. It is required to visit your organization on every Saturday from the month of February 2024 till completion of work.

It is assured that there will be no disturbance in your work schedule due to visit of our staff.

Your cooperation in this matter will be highly appreciated.

Thanking you,

Yours sincerely,

(Dr. Uday P. Naik)
Principal



DR. VITHALRAO VIKHE PATIL
COLLEGE OF ENGINEERING,
AHMEDNAGAR

www.enggnagar.com principal@enggnagar.com 0241-2777296 / 2779496 / 9356164515
 Vilad Ghat, Vadgaon Gupta, PO MIDC, Ahmednagar(MS) India - 414 111

Experimentation Results Sheet:

FRICTION WELDING MACHINE-COMPONENTS WELD REPORT, EATON-Nashik													
Print	Escape												
Excel File													
← JOB TYPE →	Frictio Force	Upsel Force	Spindl Speed	Frictio Burn-C	Upsel Burn-C	Total Burn-C	Frictio Time	Upsel Time	Weld Time	Cycle Time	Result	Time Of Weld	Remarks
ISLE 925	1.45	2.33	1953	5.61	1.74	7.35	2.30	1.40	4.66	7.28	Accept	11.08.2024/17.5	
ISLE 926	1.45	2.33	1953	5.62	1.67	7.29	2.05	1.40	4.36	7.33	Accept	11.08.2024/17.5	
ISLE 927	1.45	2.33	1953	5.71	1.73	7.44	2.40	1.40	4.73	7.71	Accept	11.08.2024/17.5	
ISLE 928	1.48	2.33	1953	5.63	1.76	7.39	2.35	1.40	4.65	7.73	Accept	11.08.2024/17.5	
ISLE 929	1.48	2.33	1953	5.69	1.73	7.42	2.35	1.40	4.68	7.61	Accept	11.08.2024/17.5	
ISLE 930	1.47	2.33	1954	5.70	1.72	7.42	2.30	1.40	4.71	7.61	Accept	11.08.2024/17.5	
ISLE 931	1.45	2.33	1953	5.70	1.81	7.51	2.35	1.40	4.70	7.43	Accept	11.08.2024/17.5	
ISLE 932	1.44	2.33	1954	5.66	1.79	7.45	2.35	1.40	4.65	7.50	Accept	11.08.2024/17.5	
ISLE 933	1.46	2.33	1953	5.65	1.71	7.36	2.35	1.40	4.66	7.63	Accept	11.08.2024/17.5	
ISLE 934	1.45	2.33	1952	5.71	1.77	7.47	2.40	1.40	4.75	7.65	Accept	11.08.2024/17.5	
ISLE 935	1.41	2.32	1953	5.68	1.78	7.46	2.30	1.40	4.68	7.36	Accept	11.08.2024/18.0	
ISLE 936	1.45	2.33	1953	5.62	1.69	7.31	2.25	1.40	4.57	7.61	Accept	11.08.2024/18.0	
ISLE 937	1.40	2.33	1954	5.70	1.68	7.38	2.25	1.40	4.59	7.55	Accept	11.08.2024/18.0	
ISLE 938	1.46	2.33	1952	5.66	1.72	7.37	2.35	1.40	4.70	7.68	Accept	11.08.2024/18.0	
ISLE 939	1.46	2.33	1953	5.61	1.73	7.34	2.35	1.40	4.71	7.33	Accept	11.08.2024/18.0	
ISLE 940	1.46	2.33	1953	5.65	1.78	7.43	2.25	1.40	4.61	7.79	Accept	11.08.2024/18.0	
ISLE 941	1.53	2.38	1953	5.67	1.67	7.34	2.00	1.40	4.34	7.23	Accept	11.08.2024/18.0	
ISLE 942	1.45	2.34	1953	5.66	1.73	7.40	2.30	1.40	4.64	7.41	Accept	11.08.2024/18.0	
ISLE 943	1.44	2.33	1953	5.67	1.74	7.41	2.30	1.40	4.64	7.46	Accept	11.08.2024/18.0	
ISLE 944	1.46	2.34	1954	5.66	1.78	7.45	2.30	1.40	4.62	7.65	Accept	11.08.2024/18.0	
ISLE 945	1.43	2.33	1953	5.68	1.69	7.37	2.35	1.40	4.66	7.63	Accept	11.08.2024/18.0	
ISLE 946	1.45	2.32	1953	5.61	1.74	7.35	2.35	1.40	4.70	7.70	Accept	11.08.2024/18.0	
ISLE 947	1.45	2.32	1953	5.62	1.77	7.39	2.40	1.40	4.70	7.63	Accept	11.08.2024/18.0	
ISLE 948	1.44	2.33	1952	5.62	1.75	7.37	2.40	1.40	4.73	7.71	Accept	11.08.2024/18.0	
ISLE 949	1.46	2.32	1953	5.67	1.74	7.41	2.35	1.40	4.74	7.75	Accept	11.08.2024/18.0	
ISLE 950	1.45	2.32	1953	5.69	1.72	7.41	2.25	1.40	4.62	7.58	Accept	11.08.2024/18.0	
ISLE 951	1.47	2.33	1953	5.69	1.67	7.36	2.30	1.40	4.67	7.38	Accept	11.08.2024/18.0	
ISLE 952	1.77	2.34	1953	5.61	0.88	6.50	3.65	1.40	6.01	8.90	Reject	11.08.2024/18.2	
MSK 76 (EATON UNIT)	2.47	4.75	1709	9.01	2.06	11.07	3.30	1.70	7.17	10.03	Accept	11.08.2024/18.3	
MSK 76 (EATON UNIT)	2.48	4.62	1709	9.00	0.93	9.93	4.65	1.70	8.54	11.44	Reject	11.08.2024/18.4	

PG Education & Research Strategy 5

1. AICTE/DST/BCUD Grants received during 2023-24.

Sr. No.	Name of the Applicant	Scheme	Title	Grant	Year	Grant Received Y/N
1	Dr. A.R. Laware & Dr. R.R. Navthar	SERB-SURE	Modelling and Control of Non-linear Multivariable System with Delay, Parametric Uncertainty & External Disturbances: An Experimental Validation with Soft Computing Approaches.	16,80,200/-	2023-24	N

Documents:

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SERB SURE
STATE UNIVERSITY RESEARCH EXCELLENCE

ePPMS

Modelling and Control of Non-linear Multivariable System with Delay, Parametric Uncertainty & External Disturbances: An Experimental Validation with Soft Computing Approaches.

File Number : SUR/2023/000852

Submitted By : Dr. Ajit Rambhau Laware
Submission Date : 29-Nov-2023

File No. : SUR/2023/000852 | Page 1 of 32

PROPOSAL DETAILS

(SUR/2023/000852)

Dr. Ajit Rambhau Laware

ajitlaware2003@gmail.com

Professor (Electrical Engineering)

Dr. Vithalrao Vikhe Patil College of Engineering
5mjg+gw3, mude, viled ghat, Ahmednagar, Maharashtra-414111
(College (Private))

Technical Details :

Scheme :	State University Research Excellence (SERB SURE)		
Research Area :	Electrical Electronics & Computer Engineering (Engineering Sciences)		
Duration :	36 Months	Contact No :	+917420932662
Date of Birth :	01-Jun-1977		
Nationality :	INDIAN	Total Cost (INR) :	16,80,200

Project Summary :

Historically, the process industry accepted 'automatic control' for proper functioning of production process. Though 95% of industrial processes preferred proportional-Integral-Derivative (PID) control loops, certain characteristics such as delay, nonlinearities, time variant nature of processes, constraints and multivariable interactions are not intended/considered explicitly in the design of PID control loops. An accumulation of time-delays adversely affect the dynamic performance of many processes and reduces gain margin. Even, it destabilizes the closed-loop system. The problem of parametric uncertainty is a big challenge. Modeling a complex process is often difficult due to modeling errors. Sometimes, if an attempt is made to take into account all process dynamics and reduce modeling errors, a highly complex model came into existence which is too difficult for mathematical analysis and design of controller. External disturbances harm the system performance. Therefore, rejection of external disturbance is one key objective while designing the controller. In this project, multivariable processes (Flow-Temperature and Level-Temperature) will be fabricated and modeled as first-order plus dead-time (FOPDT) or second-order plus dead-time (SOPDT) processes. The typical control strategies such as PID, sliding mode control and its variants along with soft computing algorithms will be proposed to address delays, parametric uncertainty and bounded external disturbances via simulation, and experimental tests. Two multivariable systems are considered which are Flow-Temperature and Level-Temperature. In this research project, following activities are planned: 1. Fabrication of multi-input multi-output (MIMO) plant. 2. Development of mathematical model. 3. Simulation algorithms using combination of typical control designs and soft computing algorithms. 4. Experimental validation of simulation tests. 5. Comparison with traditional control strategies. It is envisaged that the automation industries such as Tanfac Industries (Cuddalore, Tamilnadu, India), Rite water solution (Nagpur), Tata chemicals, Pidilite Industries, BASF India Ltd., UPL Limited, Coromandel International Ltd. etc., may be interested with the proposed research results.

Objectives :

- Fabrication of multivariable process system
- Study the dynamics of multi-input multi-output (MIMO) plant.
- Mathematical modelling of MIMO processes.
- Analyze interactions and behaviour of processes.
- Solve the problem of designing robust controller to delay, parametric uncertainty and external bounded disturbances from the use of typical controller designs and soft computing algorithms.
- Integrate the capabilities of traditional control design methods and soft computing techniques.
- Experimental validation of simulation tests for MIMO plant.
- To compare the control performance of classical controllers with soft computing methods.
-
-

Keywords :

Multivariable process, Soft computing algorithms, Delay-time, Uncertainty and disturbances, Real time experimentation

Expected Output and Outcome of the proposal :

Outputs: As per earlier discussions, prevalent design methods for multivariable process with dead-time leads to unsatisfactory performance, frequent retuning of parameters, loop interactions etc. The important hurdle is the tuning of process and controller parameters. Using soft computing or intelligent mechanism, the expected outputs and outcomes are: 1. Easy tuning of multivariable system parameters. 2. Investigations on loop interactions, input-output pairings. 3. Exploration of characteristic behavior of multivariable plant. 4. Stability and robustness issues are to be solved. 5. Better command-tracking and external bounded disturbance rejection capabilities. 6. Finally, time-domain and frequency domain metrics will be enhanced with the proposed strategies. Outcomes: 1. An alternative solution to the dead-time, parametric uncertainty and external bounded disturbances using virtues of classical time, parametric uncertainty and soft computing techniques thereby making a significant contribution. 2. Control scheme formulation to work with time-delays and constraints in multivariable plants. 3. An integration of hybrid control design strategies to solve the problem of time-delays, parametric uncertainty, constraints and external disturbances in MIMO process systems. 4. Discussion on the results obtained with prevalent control design methods.

Any other relevant Information:

NA

Suitability of the proposed work in major national initiatives of the Government:

Startup India, Innovate India

Theme of Proposed Work:

Energy

Collaboration Details for last 5 Years :

Planned Collaboration for the proposed work with any foreign scientist/ Institution ? No

Other Technical Details

PROJECT TITLE: - Modelling and Control of Non-linear Multivariable System with Delay, Parametric Uncertainty & External Disturbances: An Experimental Validation with Soft Computing Approaches

1. State of art:

It is well known that though the proportional-Integral-Derivative (PID) controller is widely used in process industries, it has certain drawbacks such as 'retuning' of gains in presence of time-delay, parametric uncertainty and external disturbances. Sometimes, it gives 'PD' kicks. Robustness and stability are the major issues related to PID controller. A robust controller like sliding mode controller (SMC) experiences 'chattering' due to switching element present in discontinuous control input to the plants though SMC shows satisfactory response under parametric uncertainty and external bounded disturbances.

To alleviate/reduce the chattering, second-order/ higher-order SMC are used. However, it requires more information of first-order time derivative of sliding manifold. Relative degree on control input is two or more respectively. However, stability and robustness issues are inexplicable. To alleviate chattering, many researchers have been follows twisting, super-twisting, global & drift algorithms, observers etc. Moreover, in all variants, the performance depends on proper selection of gain coefficients of control input. Hence, some researchers have gone for fuzzy logic and time-varying surfaces etc.

To handle above difficulties, modern optimization techniques (soft computing algorithms) such as particle swarm optimization, ant colony, artificial bee colony Jaya optimization algorithms etc. are used. To improve the closed-loop response of multivariable plants, it is necessary to use soft computing algorithms and/or their hybrid combinations.

2. Origin of the Proposal

In most of industrial processes, design and implementation of control systems affirm a broader perspective in the design, not just single-loop controllers (SLCs) as it contains several manipulated and controlled variables. These industrial processes are termed as 'multivariable control systems'. Multivariable process control area has been drastically changed in the last two decades. This change is due to the complexity of plants and interactions among process variables. The tremendous increase in

3	Flow transmitter and temperature transmitter, Nos: 4		
4	Power supply: Make Meanwel, o/p: 24V, 0-7 A, Nos: 2	Imported	5,000=00
5	Variable frequency drive, 0.75kW, 1ph, i/p: 230V, o/p: 3ph with v/f control, Nos.: 2	Imported	30,000=00
6	Plunger pump: Model PL2017, Flow 200LPH (SS 410 plungs and liquid head) with 3ph, 230V, 0.5HP AC motor, coupling, base frame and coup guard or one can opt Pneumatic control valve, Nos.: 04, I/P converters, Nos.:04, Air filter regulators, Nos: 2 and Pressure gauges, Nos.: 4	Imported	1,30,000=00
Total:			8,80,000

4.5 Environmental impact assessment and risk analysis: NA

5. Expertise:

5.1 Expertise available with the investigators in executing the project:

Following are the expertise area of PI and CO-PI.

PI: 1) Control system design, 2) Process control systems and 3) Optimizations.

CO-PI: 1) Control system engineering, 2) Artificial neural network, 3) Fluid mechanics

4.2 Summary of roles/responsibilities for all Investigators:

Name of the Investigators	Roles/Responsibilities
Dr. Laware Ajit Rambhau	<ol style="list-style-type: none"> Literature survey Problem formulation Process study Development of mathematical models Controller designs Analysis of multi-tank system results Result discussions and interpretation Writing reports Publications
Dr. Navthar Ravindra Rambhau	<ol style="list-style-type: none"> Study of process characteristics Controller design Design review Result discussions Checking- reports

Undertaking by the Principal Investigator


To

The Secretary
SERB, New Delhi

Respected Sir,

I, Dr. Laware Ajit Rambhau_ hereby certify that the research proposal titled **Modeling and Control of Non-linear Multivariable System with Delay, Parametric Uncertainty & External Disturbances: An Experimental Validation with Soft Computing Approaches**

submitted for possible funding by SERB, New Delhi is my original idea and has not been copied/taken verbatim from anyone or from any other sources. I further certify that this proposal has been checked for plagiarism through a plagiarism detection tool i.e. turnitin approved by the Institute and the contents are original and not copied/taken from any one or many other sources. I am aware of the UGCs Regulations on prevention of Plagiarism i.e. University Grant Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulation 2018. I also declare that there are no plagiarism charges established or pending against me in the last five years. If the funding agency notices any plagiarism or any other discrepancies in the above proposal of mine, I would abide by whatsoever action taken against me by SERB, as deemed necessary.

 29.11.2023
Signature of PI with date

Name / designation
Dr. Laware Ajit Rambhau

Head of Department
Dept. of Electrical Engg.
Dr.V.V.P.College of Engg.
Ahmednagar

Certificate from the Investigator

Project Title: Modelling and
Control of Non-linear
Multivariable System with
Delay, Parametric Uncertainty &
External Disturbances: An
Experimental Validation with
Soft Computing Approaches

It is certified that

1. The same project proposal has not been submitted elsewhere for financial support.
2. We/I undertake that spare time on equipment procured in the project will be made available to other users.
3. We/I agree to submit a certificate from Institutional Bio safety Committee, if the project involves the utilization of genetically engineered organisms. We/I also declare that while conducting experiments, the Bio safety Guidelines of Department of Biotechnology, Department of Health Research, GOI would be followed in to.
4. We/I agree to submit ethical clearance certificate from the concerned ethical committee, if the project involves field trails/experiments/exchange of specimens, human & animal materials etc.
5. The research work proposed in the scheme/project does not in any way duplicate the work already done or being carried out elsewhere on the subject.
6. We/I agree to abide by the terms and conditions of SERB grant.

AR Laware . Dr. Laware Ajit Rambhau

Name and signature of Principal Investigator: **Head of Department**
Date: 27/11/2023
Place: Ahmednagar
Dept. of Electrical Engg.
Dr.V.V.P.College of Engg.
Ahmednagar

Name and signature of Co-PI (s) (if any):

Date: 27/11/2023
Place: Ahmednagar
Dr. Ranjitha Rambhau Nanthar

HOD & Professor
Dept. of Mechanical Engg.
Dr. V. V.P. College of Engg.
Ahmednagar

॥ न हि ज्ञानेन सदृशं पवित्रमिह विद्यते ॥
Dr. Vitthalrao Vikhe Patil Foundation's
Dr. Vithalrao Vikhe Patil College of Engineering
Affiliated to SPPU, Pune (ID. No. PU/AN/Engg./027/(1983)
Recognized by AICTE, New Delhi & Government of Maharashtra
Accredited by NAAC with A+ Grade (3.34 CGPA) & NBA, New Delhi

CEH Elect/2023/3150

DAK 27/11/2023

Endorsement from the Head of the Institution of PI


This is to certify that:

1. Institute welcomes participation of Name: Dr. Laware Ajit Rambhau Designation: Professor as the Principal Investigator and Dr. Navthar Ravindra Rambhau as the Co-Investigator/s for the project titled **Modeling and Control of Non-Linear Multivariable System with Delay, Parametric Uncertainty & External Disturbances: An Experimental Validation with Soft Computing Approaches** and that in the unforeseen event of discontinuance by the Principal Investigator, the Co-Investigator will assume the responsibility of the fruitful completion of the project with the approval of SERB.
2. The PI, Dr. Laware Ajit Rambhau is a permanent or regular employee of this Institution.
3. The project starts from the date on which the Institution receives the grant from SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
4. The investigator will be governed by the rules and regulations of the Institution and will be under administrative control of the Institution for the duration of the project.
5. The grant-in-aid by the SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi will be used to meet the expenditure on the project and for the period for which the project has been sanctioned as mentioned in the sanction order.
6. No administrative or other liability will be attached to SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi at the end of the project.
7. The Institution will provide basic infrastructure and other required facilities to the investigator for undertaking the research project.
8. The Institution will take into its books all assets created in the above project and its disposal would be at the discretion of SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
9. The Institution assumes to undertake the financial and other management responsibilities of the project.

Seal of Institution

Date: 27/11/23




Signature
Principal
Registrar of University/Head of the Institution
College of Engineering,
Ahmednagar

Contd... 2..



DR. VITHALRAO VIKHE PATIL
COLLEGE OF ENGINEERING,
AHMEDNAGAR



॥ न हि ज्ञानेन सदृशं पवित्रमिह विद्यते ॥
**Dr. Vithalrao Vikhe Patil Foundation's
Dr. Vithalrao Vikhe Patil College of Engineering**

Affiliated to SPPU, Pune (ID. No. PU/AN/Engg./027/(1983)
Recognized by AICTE, New Delhi & Government of Maharashtra
Accredited by NAAC with A+ Grade (3.34 CGPA) & NBA, New Delhi



- 2 -

Endorsement from the Head of the Institution of Co-PI

This is to certify that:

10. Institute welcomes participation of Name (PI): Dr. Laware Ajit Rambhau Institute Name: Dr. Vithalrao Vikhe Patil College of Engineering, Ahmednagar as the Principal Investigator and Name (Co-PI) Dr. Navthar Ravindra Rambhau Designation: Professor as the Co- Investigator/s for the project titled **Modeling and Control of Non-Linear Multivariable System with Delay, Parametric Uncertainty & External Disturbances: An Experimental Validation with Soft Computing Approaches.**
11. The Co-PI, Dr. Navthar Ravindra Rambhau is a permanent or regular employee of this Institution.
12. The Co-PI will be governed by the rules and regulations of the Institution and will be under administrative control of the Institution for the duration of the project.
13. The Institution will provide basic infrastructure and other required facilities to the investigator for undertaking the research project.
14. No administrative or other liability will be attached to SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi at the end of the project.

Seal of University / Institution

Date: 27.11.23



Registrar of University/Head of the Institution
College of Engineering
Ahmednagar


Signature




PRINCIPAL
Dr. Vithalrao Vikhe Patil
College of Engineering
Ahmednagar

