

I. INSTRUCTIONAL CONTRIBUTION:

(a) Teaching Engagement

➤ Semester I (Odd Semester)

Level	Sr. No.	Title of the Course(s) Taught	Course Code	Program (B.Tech./M.Tech/ I.M.Sc.) and Branch	No. of Students (Actually Engaged in Case of Multiple Divisions)	Weekly Load (Hr) (Actually Engaged in Case of Shared Load) L – T – P
PG	1	Advanced Fluid Dynamics	ME 607	M. Tech-I (Turbomachines)	20	3-0-0
	2	Computational Methods in Fluid Flow and Heat transfer	ME 725	M. Tech-I (Thermal Systems Design)	20	3-0-0

➤ Semester II (Even Semester)

Level	Sr. No.	Title of the Course(s) Taught	Course Code	Program (B.Tech./M.Tech/ I.M.Sc.) and Branch	No. of Students (Actually Engaged in Case of Multiple Divisions)	Weekly Load (Hr) (Actually Engaged in Case of Shared Load)L – T – P
UG	1.	Fluid Mechanics	ME 208	B. Tech. II (M)	80	Div. A: 3-0-0
PG	1	Computational Fluid Dynamics Techniques	ME 608	M. Tech.-II (Turbomachines)	20	3-0-0

(b) Project and Thesis (Dissertation) Supervision:

Level	Sr. No.	Title of the Project Dissertation	Name of the Student(s)	Program & Branch (B.Tech/ M.Tech/ M.Sc.)	Role (Supervisor /Co-supervisor	Name of other supervisor/co-supervisor, if any
UG	Completed					
	1	Investigations on the use of PCM to reduce air conditioning load of a car	Arman M. Mansuri U16ME180 Rajat P. Sanghai U16ME182 Chaitanya R. Patange U16ME184 Mangaldeep A.	Mechanical	Supervisor	-----

			Singh Pannu U16ME185 Nishant A. Pranami U16ME186			
	2	Investigations on oscillating jet instability and atomization characteristics	Sanket Ambedkar U16ME011 Varun Vidiyala U16ME089 Ajinkya Zalte U16ME101 Trushil Chauhan U16ME073 Aman Rathore U16ME062	Mechanical	Supervisor	-----
PG	<u>Completed</u>					
	1	Numerical Analysis of Aeration from Plunging Liquid Jet	Mr. Rahul Jha P18TM001	Turbomachines	Supervisor	-----
	2	Electro-wetting Induced Droplet Detachment from Hydrophobic Surfaces: A Numerical Advent	Mr. Sagar G. Nayak P18TM013	Turbomachines	Supervisor	-----
	3	Numerical Analysis of Film Boiling Using Open FOAM	Mr. Sharma Siddharth Durgaprasad P18TM002	Turbomachines	Supervisor	-----
	4	Computational Fluid Dynamics (CFD) Analysis of a Medium Head Hydroelectric Power Plant	Mr. Boghani Salman Salimbhai P18TM006	Turbomachines	Supervisor	-----
	5	Analysis of heat Transfer in Spray Cooling of High Temperature Surface in the Film Boiling regime	Mr. Mirikar Dnyanesh Narayanrao P18TD003	Thermal Systems Design	Supervisor	-----
	<u>Ongoing</u>					
	1.	Numerical simulation of vibration induced droplet	Sangamesh Suligavi P19TM016	Turbomachines	Supervisor	-----

	detachment				
2.	Image processing of slug and wavy flow	Digpriya Chaudhary P19TM018	Turbomachines	Supervisor	-----
3.	Numerical analysis of flow boiling in a slug flow regime of a microchannel using interface-evaporation model	Nirav Chaudhary P19TD022	Thermal Systems Design	Supervisor	-----

(c) Other Instructional Tasks:

(such as development of lab/course, Instructional software, Education packages, etc.).

1. Development of Online teaching modules on “Advanced Fluid Dynamics” in view of COVID-19

2. Development of Online teaching modules on “Computational Methods in Fluid Flow and Heat transfer” in view of COVID-19

II. ACADEMIC RESEARCH CONTRIBUTION:

(a) Ph.D. Research Supervision:

Sr. No	Admission No	Name of Student	Title of Thesis/Area of Research	Category (FIR/PE S/FRS/FSF etc.)	Role (Supervisor / Co-supervisor)	Name of all other supervisor(s), if any	Status: Ongoing/ Submitted/ Awarded
1.	D16ME011	Digant S. Mehta	Analysis towards the augmentation of thermal performance in shell and tube type latent heat storage unit	QIP	Co-supervisor	Dr. M K Rathod	Thesis defended on 21 st Jan 2021.
2.	D17ME	Ashish Arote	Fundamental properties of spatially oscillating liquid jets: A numerical approach	FIR	Supervisor	Dr. Bade Mukund	Thesis defended on 11th June 2021.
3.	D17ME003	Dnyandip Bhamare	Performance evaluation of building roof integrated with PCM layer in	FIR	Co-supervisor	Dr. M K Rathod	Pre-synopsis seminar completed

			Indian context				
4.	D17ME001	Sunny Saini	Experimental Investigations on Intermittent Flow Regime Of Air-Water Two-Phase Flow Through Pipe	FIR	Supervisor	----- --	Permission for pre-synopsis seminar granted
5.	D18ME	Nishant Shah	Analysis of boiling flow through microchannel	FIR	Supervisor	Dr. H B Mehta	Ongoing
6.	D19 ME	Chetan Anghan	Direct Numerical simulation of jets in Ocean wave Environment	FIR	Supervisor	Dr. Bade Mukund	Ongoing
7.	D19ME	Krishna Kumar	Experimental and Numerical Investigations on two phase flow under oscillating conditions	PEC	Supervisor	Dr. H B Mehta	Ongoing

(b) Research Papers Published/Accepted in Journals (During the review period)

Sr. No.	Title of Paper	List of All Authors as per sequence in paper	Journal Name	Vol. No.	Year	Page No.	Indexed in: Scopus/ SCI
1.	Numerical model for evaluating thermal performance of residential building roof integrated with inclined phase change material (PCM) layer	Bhamare, Dnyandip K., Manish K. Rathod, and Jyotirmay Banerjee	Journal of Building Engineering	28	2020	101018	SCI
2.	Enrichment of heat transfer in a latent heat storage unit using longitudinal fins	Digant S Mehta, Bhavesh Vaghela, Manish K Rathod, Jyotirmay Banerjee	Heat Transfer-Asian Research,	49(5)	2020	2659-2685	SCI
3.	An improved compressive volume of fluid scheme for capturing sharp interfaces using hybridization	Arote, Ashish, Mukund Bade, and Jyotirmay Banerjee	Numerical Heat Transfer, Part B: Fundamentals	79(1)	2020	29-53	SCI
4.	Evaluation of cooling potential of passive strategies using	Bhamare, Dnyandip K.,	Journal of Building	31	2020	10135	SCI

	bioclimatic approach for different Indian climatic zones	Manish K. Rathod, and Jyotirmay Banerjee	Engineering			6	
5.	Thermal performance augmentation in latent heat storage unit using spiral fin: An experimental analysis	Digant S Mehta, Bhavesh Vaghela, Manish K Rathod, Jyotirmay Banerjee	Journal of Energy Storage	31	2020	101776	SCI
6.	Selection of phase change material and establishment of thermophysical properties of phase change material integrated with roof of a building using Measure of Key Response index: proposal of a new parameter.	Dnyandip K. Bhamare, Rathod Manish K and Jyotirmay Banerjee	Journal of Energy Storage	32	2020	101812.	SCI
7.	A bioclimatic assessment tool for investigating the potential of passive cooling strategies for distinct climatic zones of India	Dnyandip K. Bhamare, Rathod Manish K and Jyotirmay Banerjee	Journal of Building Engineering	31	2020	101356	SCI
8.	Selection of phase change material and establishment of thermophysical properties of phase change material integrated with roof of a building using Measure of Key Response index: Proposal of a new parameter	Bhamare, Dnyandip K., Manish K. Rathod, and Jyotirmay Banerjee	Journal of Energy Storage	32	2020	101812	SCI
9.	Behavior of Synchronous and Asynchronous Spatially Oscillating Planar Liquid Jets in Tandem	Arote, Ashish, Mukund Bade, and Jyotirmay Banerjee	Physics of Fluids	33(5)	2021	052102	SCI
10.	On Coherent Structures of Spatially Oscillating Planar Liquid Jet Developing in a Quiescent Atmosphere	Arote, Ashish, Mukund Bade, and Jyotirmay Banerjee	Physics of Fluids	32(8)	2020	082111	SCI
11.	Properties of Blended Advection Schemes for Hyperbolic Conservation Laws	Arote, Ashish, Mukund Bade, and Jyotirmay Banerjee	Sadhana, Indian Academy of Science	2021		doi: 10.1007/s12046-021-01609-0	SCI
12	Numerical Analysis of Droplet Detachment from Hydrophobic Surfaces during Electro-wetting	Nayak, Sagar G., and Jyotirmay Banerjee	Multiphase Science and Technology	33(1)	2021	19-41	SCI
13.	Physics of aeration in slug: Flow visualization analysis in horizontal pipes,	S. Saini, J. Thaker, and J. Banerjee	Journal of Visualization	24	2021	917–930	SCI
14.	Recurrence analysis of pressure signals for identification of	S. Saini and Jyotirmay Banerjee	Journal of Petroleum Science and	204	2021	108758	SCI

	intermittent flow sub-regimes.		Engineering				
15.	On instantaneous pressure surges and time averaged pressure drop in intermittent regime of two-phase flow	J. Thaker, S. Saini, and Jyotirmay Banerjee	Journal of Petroleum Science and Engineering	205	2021	108971	SCI
16.	Recognition of onset of slug using recurrence analysis of pressure signal	S. Saini, and Jyotirmay Banerjee	Nuclear Engineering and Design	381	2021	111325	SCI
17.	Heat transfer enhancement using spiral fins in different orientations of Latent Heat Storage Unit	Digant S Mehta, Bhavesh Vaghela, Manish K Rathod, Jyotirmay Banerjee	International Journal of Thermal Sciences	169	2021	107060	SCI
18.	A machine learning and deep learning based approach to predict the thermal performance of phase change material integrated building envelope	Dnyandip K. Bhamare, Rathod Manish K, Rakhsit D. and Jyotirmay Banerjee	Building and Environment	199	2021	107927	SCI
19.	Proposal of a unique index for selection of optimum phase change material for effective thermal performance of a building envelope	Dnyandip K. Bhamare, Rathod Manish K and Jyotirmay Banerjee	Solar Energy	218	2021	129-141	SCI
20.	Direct numerical simulation of forced turbulent round jet: Effect of flow confinement and varicose excitation	Dave,S., Anghan,C., Saincher,S., Banerjee J.	Physics of Fluids	33(7)	2021	075108	SCI Editor's Pick

(c) Conference Papers (During the review period)

Sr. No.	Title of Paper	List of All Authors as per sequence in paper	Name of conference and Venue	Dates	Vol No. of Proc.	Page Nos.	Indexed in: Scopus/Web of Science/SCI/Any other
1	Transition of stratified-wavy flow to intermittent flow pattern: nonlinear analysis of pressure fluctuations	S. Saini, J. Thaker, and J. Banerjee,	2 nd International Conference on Future Learning Aspects of Mechanical Engineering (FLAME), Amity University	5-7 Aug 2020	Advances in Engineering Design; Select Proceedings of FLAME 2020, pp 35-46, DOI: 10.1007/978-981-33-4684-0_5		Scopus
2.	Analysis of interfacial	D. Chaudhary,	Advances in Thermal-Fluids	24-25 March	IOP Conference Series: Materials		-----

	behavior in two-phase flow using image processing,	S. Saini and J. Banerjee	Engineering (ATFE), 2021, PDPU Gandhinagar	2021	Science and Engineering, 1146 (2021) 012002, doi:10.1088/1757-899X/1146/1/012002	
3	Liquid Film Thickness Measurement: A Critical Review	Nayak, Sagar G., Nishant M. Shah, and Jyotirmay Banerjee.	2nd International Conference on Future Learning Aspects of Mechanical Engineering (FLAME), Amity University	5-7 Aug 2020	Advances in Fluid and Thermal Engineering: Select Proceedings of FLAME 2020, Springer, Singapore, 101-111. DOI:10.1007/978-981-16-0159-0_10	Scopus
4	Comparative Study of the Fluid Interface-Capturing High-Resolution Algebraic Schemes	Arote, Ashish, Mukund Bade, and Jyotirmay Banerjee.	2nd International Conference on Future Learning Aspects of Mechanical Engineering (FLAME), Amity University	5-7 Aug 2020	Advances in Fluid and Thermal Engineering :Select Proceedings of FLAME 2020, Springer, Singapore, pp., 23-32	Scopus

(d) Book Edited

Sr. No.	Editors	Title of the Book	Year of Publication	ISBN/ISSN No.	Publisher
1.	T. Prabu, P. Viswanathan, Amit Agrawal and Jyotirmay Banerjee	Fluid Mechanics and Fluid Power :Proceedings of FMFP 2019	2021	ISSN 2195-4356 ISSN 2195-4364 (electronic) Lecture Notes in Mechanical Engineering ISBN 978-981-16-0697-7 ISBN 978-981-16-0698-4	Springer Nature Singapore Pte. Ltd.

(e) Book Chapters in Lecture Notes by Springer

Sr. No.	Authors	Title of the Text/Chapter/Book/Manual	Year of Publication	ISBN/ISSN No.	Publisher
1.	S. Saini, N. Shah and J. Banerjee,	Transition of Stratified to Intermittent Flow Pattern	2021 (page 239)	Lecture Notes in Mechanical Engineering ISBN 978-981-16-0697-7 https://doi.org/10.1007/978-981-16-0698-4_26	Springer Nature Singapore Pte. Ltd.
2	Kathankumar N. Khalasi, Nishant M. Shah, and	Dynamic Contact Angle Formulation for Numerical Analysis of Taylor Bubble Flow Over Obstacle	2021 (page 263)	Lecture Notes in Mechanical Engineering ISBN 978-981-16-0697-7 https://doi.org/10.1007/978-	Springer Nature Singapore Pte. Ltd.

	Jyotirmay Banerjee			981-16-0698-4_29	
3.	Bhaves V. Vaghela, Digant S. Mehta, Manish K. Rathod, and Jyotirmay Banerjee	Investigations on Thermal Performance of Spiral Finned Latent Heat Storage Unit	2021 (page 285)	Lecture Notes in Mechanical Engineering ISBN 978-981-16-0697-7 https://doi.org/10.1007/978-981-16-0698-4_31	Springer Nature Singapore Pte. Ltd.
4.	Rujal D. Patel, Sagar G. Nayak, and Jyotirmay Banerjee	Hydrodynamic Effect of Tsunami Wave on Oscillating Water Column (OWC) Type Wave Energy Converter (WEC)	2021 (page 343)	Lecture Notes in Mechanical Engineering ISBN 978-981-16-0697-7 https://doi.org/10.1007/978-981-16-0698-4_51	Springer Nature Singapore Pte. Ltd.
5	Rohit Singh Gulia, Siddharth Sharma, and Jyotirmay Banerjee	Stability Analysis of Two-Phase Slug Flow Using OpenFOAM	2021 (Page 471)	ISSN 2195-4356 ISSN 2195-4364 (electronic) Lecture Notes in Mechanical Engineering ISBN 978-981-16-0697-7 https://doi.org/10.1007/978-981-16-0698-4_51	Springer Nature Singapore Pte. Ltd.
6	Rahul Jha, Ashish Arote, and Jyotirmay Banerjee	Advection Stabilization Using Lower-Order Scheme Blending: A Case Study of Rayleigh–Taylor Instability	2021 (page 795)	Lecture Notes in Mechanical Engineering ISBN 978-981-16-0697-7 https://doi.org/10.1007/978-981-16-0698-4_88	Springer Nature Singapore Pte. Ltd.

III. SPONSORED RESEARCH & CONSULTANCY PROJECTS:

(a) Sponsored Research Projects (During the Review Period):

Sr. No.	Title of Project	Duration		Sponsoring Agency	Amount [in Lakhs]	Role: PI/Co-PI	All other Investigators, if any, and their roles	Status: Ongoing/ Completed
		From	To					
1	Linear Stability Analysis of Interface Dynamics in Two Phase Jets	06/02/2020	05/02/2023	SERB/F/9855/2019-2020 dated 06 February, 2020	6,00,000/- MTR/2019/000941 (MATRICS-SERB)	PI	----- -----	Ongoing

(b) Consultancy/Testing Projects (During the Review Period):

Sr. No.	Details of Consultancy/Testing Work	Period/Year	Organization	Amount [in lakhs]	Role: PI/Co-PI
1.	CFD analysis of hydroelectric power plant at Manerbhali stage I for finalization of location of proposed outfall gate letter no. 660/UNNL103IDirectorprojects/EE(PCM-I-BV)T-I, Nov.17, 2018.	18 Months	UJVNL Stage -1	Rs. 10,60,000/- (Part -1) + Rs. 5,00,000/- Part-II)	In collaboration with Prof. P. L. Patel in CED

(c) Products/ Processes Development and Technology Transfer /Patents:

Sr. No.	Title of Patent	Registration No.	Date of Award	Awarding Country	Inventors	Name of Organization/Industry, in case of Tech. Transfer
1.	Pin fin Embedded Stepped Minichannel Heat Sink.	Design patent: 332649-001	13-05-2021	India	Shah, N., Mehta, H., & Banerjee, J.	SVNIT Surat
2.	Stepped Variable Width Minichannel Heat Sinks.	Design patent file: 332650-001	21-04-2021	India	Shah, N., Mehta, H., & Banerjee J.	SVNIT Surat

IV. OTHER ACADEMIC ACTIVITIES:

(a) Organization of Courses/ Conferences/Workshop/STTP

As a Secretary of National Society of Fluid Mechanics, India was instrumental in organizing “**8th International and 47th National Conference on Fluid Mechanics and Fluid Power (FMFP-2020)**”, during 09-11th Dec-2020 organized by IIT Guwahati, Assam, India under the umbrella of National Society in Fluid Mechanics and Fluid power

(b) Expert Lecture/Talk Delivered in CEP/ QIP/STTP/ Special Lectures:

Sr. No.	Title of the Talk	Name of the Program in which the Talk is Delivered	Date of Talk	Organizer and Venue
1	Solution of Navier-Stokes equation for incompressible flows: Pressure-Velocity Coupling	Fundamentals and Modelling of CFD: Part-I,	December 21-25, 2020	Five-day STTP organized by Department of Mechanical Engg., under CCE of SVNIT Surat

(c) Participation in Courses/ Conferences/Workshop/STTP in India/Abroad

Sr. No.	Title of the Event	Period		Venue	Country	Organized By
		From	To			

(d) Academic/Research Related Visit outside Institute in India/Abroad

Sr. No.	Organization/Institute Visited	Period		Venue	Country	Purpose and Other Details of Visit
		From	To			

(e) Membership of Professional Bodies/Societies (During Review Period)

Sr. No.	Name of the Academy/Professional Body	Membership Id (if any)	Period	
			From	To
1.	Life Member of Indian Society for Technical Education (ISTE),	Membership no.: LM24248	Life Member	
2.	Life Member of Indian Society of Heat and Mass Transfer (ISHMT)	Membership no.: ISHMT-579	Life Member	
3.	Member of The Institution of Engineers, India, Membership No.:	M-139387-6 and Regn. no. 090200390590	Life Member	
4.	Life Member of National Society for Fluid Mechanics Fluid Power,	L-577	Life Member	

(f) Significant Award/Achievement/Honor/Distinction Received (During Review Period)

Sr. No.	Details of the Award/Achievement/Honor/Distinction
1.	Research paper entitled “On Coherent Structures of Spatially Oscillating Planar Liquid Jet Developing in a Quiescent Atmosphere” have been selected as “ Editor’s Pick ” in journal of Physics of Fluids published by American Institute of Physics.
2.	Research paper entitled “Direct numerical simulation of forced turbulent round jet: Effect of flow confinement and varicose excitation” have been selected “ Editor’s Pick ” in journal of Physics of Fluids published by American Institute of Physics.

(g) Contribution as External Examiner for M. Tech/Ph.D. Thesis Outside Institute, Member of National Panel, Reviewer of Journal, Book, Project Proposal or any such other contribution:

Sr. No.	Details of the Contribution
1.	Secretary of National Society of Fluid Mechanics and Fluid power, India
2.	Review of Doctoral thesis entitled “Hydrodynamics of Droplet Impingement and its Evaporation from a Heated Surface” submitted by Mr. Rajeev Kumar Singh to the Department of Mechanical Engineering, Deakin University, Australia.
3.	Ph D review committee member for Nirma University, Ahmedabad

V. ADMINISTRATIVE CONTRIBUTION:

(a) Institute Level Contribution:

Sr. No.	Position Held (Dean/Asso. Dean/Head/Chairman/Member of Committee/Centre-in Charge/Prof. In Charge/Warden/Asso. Warden/Faculty Advisor etc.	Duration		Office Order No. & Date	Brief about Activity and Contribution Made
		From	To		
1.	Dean (Academic)	1 st Jan 2018	31 st Dec 2020	E/1330 Dated 2/11/2017	<p>Coordination of Overall academic activities including admissions, scheduling all activities of academic calendar including examination.</p> <p>Coordination of IAAC meeting, APRC meeting, Senate meetings.</p> <p>MIS upgradation in terms of online academic activities in view of COVID-19.</p> <p>Revision of curriculum for UG Programs.</p>
2.	Professor In-charge Research Park	24 th Dec 2015	Till date	Extension letter: E/1714 dated 02/02/2018	<p>Student startup and incubation program based on grant received from SSIP Gujarat.</p> <p>Innovation and Incubation activities in the institute based on grant received from DST for establishing and managing ASHINE (Association for Harnessing Innovation and Incubation) at SVNIT Surat.</p>
3.	Head of Department of Mechanical Engineering	15 th April 2021	Till date	E/HEADS HIP/24 dated April 06, 2021	<p>Coordination of Overall academic activities of the department, initiated Curriculum revision of Master's program, modernization of laboratories, working for setting ups some Centre of excellence etc.</p>

(b) Department Level Contribution:

Sr. No.	Position Held (Chairman/Member of Committee/Lab-in Charge/Prof. in Charge /Coordinator/Faculty Advisor etc.	Duration		Office Order No. & Date	Brief about Contribution Made
		From	To		
1.	Section Incharge, (Thermal and Fluid Engg.)	30.04. 2019	30. 04. 2020	MED/29 7/2019- 20	Coordinating syllabus revision, time table coordination. PhD admission in thermal group

VI. OTHER IMPORTANT CONTRIBUTION NOT COVERED ABOVE

One of the Directors of Board of Governors of ASHINE, a not for profit organization for Innovation and Incubation at SVNIT Surat Some of the activities under ASHINE has been:

Sr. No.	Name of the activity	No. of Participants (Approx.)
1.	Pre-incubation level Startups supported till date	25
2.	Proof of Concept level startup supported till date	27
3.	Pre-incubation level discussion for Startups & Startup enthusiast Students of SVNIT	200
4.	Facilitating pitching of startups to investors	20