



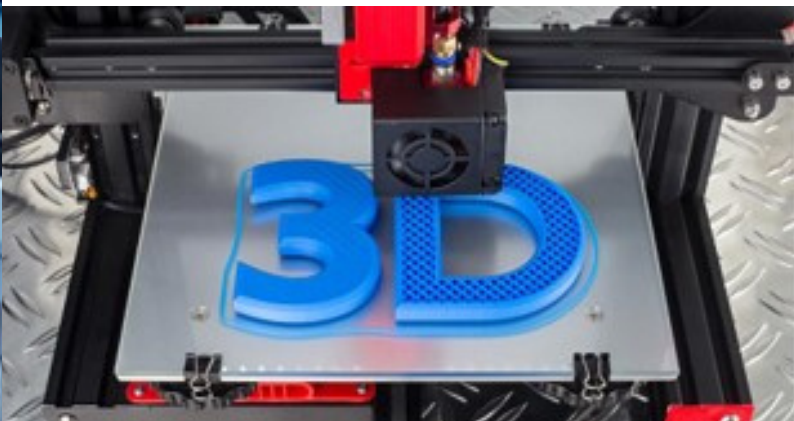
Abstracts of National Conference on Research and Developments in Material Processing, Modelling and Characterization 2020

Sponsored by



Editors

- Mayuri Baruah
- Renu Kumari
- Poulami Maji



RDMPMC-2020

26-27 August, 2020

Organized by

Department of Metallurgical and Materials Engineering

In Association with

Department of Production and Industrial Engineering

National Institute of Technology Jamshedpur, Jharkhand, India



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Mayuri Baruah
Renu Kumari
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(Editors)

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About the Conference

TEQIP III sponsored 2day National Level conference is proposed to encourage young researchers, students and faculty across India and present their novel work on the major research area on “Advancement in Materials, Modelling, Characterization, and Manufacturing Processes”. It is planned to invite research papers in different domains of Materials, Metallurgical and Manufacturing Engineering. In the upcoming generation in manufacturing sector, hybridized materials, advance manufacturing and monitoring techniques will emerge as disruptive phenomenon. In order to acquaint ourselves with such techniques, it is imperative to organize a platform where such knowledge can be shared from academicians around the country. This proposed conference aims to build a sustainable platform of sharing and increasing our knowledge in the field of Materials, Metallurgical and Manufacturing. The conference proposes to invite papers and models from the fields mentioned above. Through this conference Department of Materials and Metallurgical Engineering in collaboration with Production and Industrial Engineering, NIT Jamshedpur is providing a platform to bring together renowned speakers, researchers, students, consultants, and academicians to share their research experiences and findings. Eminent experts from premium institutes will deliver lectures on topics of specified areas.

Objectives

- To bring renowned speakers, researchers, students, consultants and academicians to a single platform for sharing the research methodologies in the proposed themes
- To elevate Department of Metallurgical and Materials Engineering and Production and Industrial Engineering in the National level
- To motivate students towards research and present their work in an expert level
- To publish conference proceedings and disseminate in the National level

About the Organizers

National Institute of Technology Jamshedpur, Jharkhand-831014

National Institute of Technology Jamshedpur is an Institute of National Importance, by an Act of Parliament (Act 29 of 2007) namely, the National Institutes of Technology Act, 2007, which received the assent of the President of India on the 5th June, 2007. This was formerly known as Regional Institute of Technology (RIT) Jamshedpur and was established on 15th August 1960 with the aim of nurturing young engineers for economic growth of the Nation. It was upgraded to NIT on 27th December 2002 with the status as Deemed University. It is the third in the chain of 8 NITs established as a part of the Second Five Year Plan (1956-61) by the Government of India and is directly under the control of MHRD. NIT Jamshedpur is situated in the western part of the city Jamshedpur. The flowing river Kharkai and picturesque backdrop of low hills on one side, and large tracts of forest on the other side, make the 341.3 acres of hilly campus an ideal place for higher learning and research. The Institute offers B. Tech (Hons.), M. Tech, MSc, MCA and PhD degrees in Civil, Computer Applications, CSE, Electrical, ECE, ME, Metallurgical & Materials, Production and Industrial Engineering, Chemistry and Physics etc. The institute is growing with NBA accreditation for three UG courses and research projects from TEQIP –III and DST.

Department of Production and Industrial Engineering

It was started in year 1988 with the name of “Production Engineering & Management”. The name of this department was changed to Production & Industrial Engineering in the year 2007. The department was accredited by NBA in 2009. This core department has a sanctioned strength of 16 (Sixteen) faculty members with flexible faculty structure. Presently, there are 02 Professor, 03 Associate professors and 08 Assistant Professors. Every faculty member has received doctorate degree in different research areas. The department is running a UG course for B. Tech. (Hons.) degree in Production and industrial Engineering and a PG course in Manufacturing Systems Engineering as well as Ph. D. program in various streams of Production and Industrial Engineering. The Department is currently developing different engineering laboratories like CAD/CAM Lab., Advanced Manufacturing and Flexible manufacturing systems Lab., Non- Traditional Manufacturing lab, and Industrial Engineering & Ergonomics lab and Central workshop. Time to time curricula/syllabus is upgraded as per the market and technology requirement. The department has also proposed to start a new PG course in Production Management which will cater to the current industrial need.

Department of Metallurgical and Materials Engineering

The department of Metallurgical and Materials Engineering was among the four branches with which the institute initially launched in 1960, with increasing focus on Advanced Materials, Composite Materials, Nanotechnology, Materials Technology, Foundry Technology, Iron & Steel, Nanotechnology, Mineral Benefaction and Corrosion and Surface Engineering. The R&D work being carried out in these field in the Metallurgical sector, Materials Engineering was included in the curriculum of the department in 1995. At present the department offers B.Tech, M.Tech and Ph.D course. The mission of the department is to train young mind and to equip them with the best possible technical knowledge to meet the current and future demand of the industries, academia & research as well as society.

About TEQIP-III

The logo for TEQIP-3 features the letters 'TE' in a black serif font, followed by a large, stylized red 'Q' with a white outline, and 'IP-3' in a black serif font.

Technical Education Quality Improvement Programme

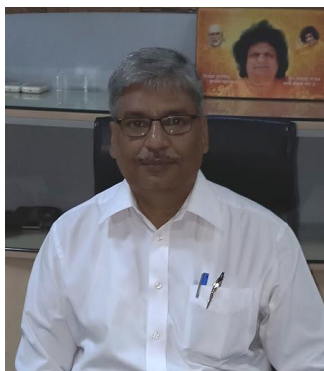
The Project, third phase of Technical Education Quality Improvement Programme (referred to as TEQIP-III) is fully integrated with the Twelveth Five-year Plan objectives for Technical Education as a key component for improving the quality of Engineering

Education in existing institutions with a special consideration for Low Income States and Special Category States (SCS) and support to strengthen few affiliated technical universities to improve their policy, academic and management practices.

The Project mainly focuses on the following objectives:

- Improving quality and equity in engineering institutions in focus states viz. 7 Low Income States (LIS), eight states in the North-East of India, three Hill states viz. Himachal Pradesh, Jammu & Kashmir, Uttarakhand and Andaman and Nicobar Islands (a union territory (UT))
- System-level initiatives to strengthen sector governance and performance which include widening the scope of Affiliating Technical Universities (ATUs) to improve their policy, academic and management practices towards affiliated institutions, and
- Twinning Arrangements to Build Capacity and Improve Performance of institutions and ATUs participating in focus states.

Message from the Director



I am very happy to note that Department of Metallurgical and Materials Engineering in association with Department of Production and Industrial Engineering, National Institute of Technology Jamshedpur is organizing an Online National Conference on “Research and Developments in Material Processing, Modeling and Characterization 2020” (RDMPMC2020) on 26th and 27th August 2020. During the current situation an online platform is an excellent idea to exchange the views by the scientists and researchers. It is heartening to note that organizing committee has arranged eight keynote lectures by the eminent experts during the conference.

The conference is aimed to broadly cover the relevant topics on Biomaterials, composites, ceramics, functionally graded materials, energy materials, thin film materials, nano materials, etc, its processing, characterization and modeling. It highlights some manufacturing techniques which have been utilized since decades and is still evolving with new dimensions such as welding, laser assisted technologies, non-traditional machining, cryogenic grinding, additive manufacturing, coating etc.

I am happy to learn that the technical papers will be published by Springer. I am sure that this online conference will provide a good platform for exchanging the ideas, learning new techniques and making good academic and professional connections. I take this opportunity to congratulate the organizers and wish the conference a great success.

Karunesh Kumar Shukla
Director,
NIT Jamshedpur

Message from the Chairman



Welcome to RDMPMC2020,

It is my great pleasure to welcome all the respected dignitaries, sponsorers and all the delegates to the Online National Conference on “Research and Developments in Material Processing, Modelling and Characterization 2020” (RDMPMC2020) being organized by the Department of production and Industrial Engineering in collaboration with the Department of Metallurgical and Materials Engineering, National Institute of Technology Jamshedpur on 26th and 27th August 2020.

First of all, I am thankful to our Honorable Director, Prof. Karunesh Kumar Shukla for his permission to organize this Conference and encouraging and inspiring the organizing team.

I sincerely thank TEQIP III for financially supporting our conference and making it possible. I also thank to other sponsoring agencies namely Gleeble Physical Simulation, Dynamic Systems Inc., USA; Bechtel Corporation, Delhi, India and AMETEK Instruments (India) Pvt Ltd, Bangalore, India for supporting our conference and helping us to meet our goals.

I congratulate Dr. Mayuri Baruah, Dr. Renu Kumari and Dr Poulami Maji, the Organizing Secretaries of the Conference for successful implementation of the objectives. I also express my sincere gratitude to the Keynote Speakers and National Advisory Committee.

I am happy to acknowledge that an overwhelming response from the delegates all over the Country is received. I am sure that RDMPMC2020 will provide an excellent opportunity for all the participants to connect, present and discuss their research relevant to the field. I am happy to announce that the Abstract of these papers are published as proceedings with ISBN and DOI identified at book level. I sincerely hope that this Conference will provide a good platform for sharing their ideas and making good academic and professional connections. I am also pleased that the technical papers will be published in two volumes of proceedings by Springer.

On behalf of the entire Organizing Committee, I take great pride in welcoming all and wish the conference a great success

Dr. Shashi Bhusan Prasad
Chairman RDMPMC 2020
HOD, Production & Industrial Engineering



It is indeed my great pleasure and privilege to invite you to attend the two day online national conference organized by Department of Metallurgical and Materials Engineering in collaboration with Department of Production and Industrial **Engineering on “Research and Developments in Material Processing, Modelling and Characterization 2020”**. The conference is sponsored by TEQIP-III

The conference provides a platform to interact, share the ideas and research in areas in Material Processing, Modelling and Characterization in the country. This provides the researchers an exposure which is not ordinarily available without this type of conferences.

In response to our efforts, we have received a total 210 papers and contributions from academicians, research scholars, post graduate students, under graduate students, and industrial working professionals around the country.

On behalf of the Department of Metallurgical and Materials Engineering, I extend a warm welcome to all the participants attending this online conference. I thank all participants whole heartedly for being a part of the conference and appreciate their eagerness to keep learning.

I wish the conferences all success.

Dr Ashok Kumar
Chairman RDMPMC 2020
Head, Dept. of Met. & Mat. Engg.

Secretary Organizing, RDMPMC 2020



It gives us a great pleasure to welcome you all for the National conference on “Research and Developments in Material Processing, Modelling and Characterization (RDMPMC-2020)” organized by Department of Metallurgical and Materials engineering in collaboration with Department of Production and Industrial Engineering, National Institute of Technology, Jamshedpur. The thematic areas of RDMPMC-2020 have been chosen with great care and diligent consideration to include the cutting-edge developments taking place in Metallurgical, Materials, Manufacturing and Industrial Engineering. Eminent researchers are being invited to deliver, keynote lectures to expose the state-of –the-art research on various critical areas related to Minerals, Materials, Manufacturing, Characterization and Modelling for the benefit of the participants. We are making a small effort in gathering researchers and stakeholders at one platform through this conference to exchange the ideas, and also to serve a strong base for participants for networking. In response to our efforts, we have received a total 210 papers all over the country. Faculties, Research Scholars, Post graduate, Under graduate students, and Industrialists around the country have submitted their research papers. We hope this small event will help the participants in enriching their knowledge and derive a great benefit.

Dr. Mayuri Baruah, Assistant Professor, Production and Industrial Engineering, NIT Jamshedpur

Dr. Renu Kumari, Assistant Professor, Metallurgical and Materials Engineering, NIT Jamshedpur

Dr. Poulami Maji, Assistant Professor, Metallurgical and Materials Engineering, NIT Jamshedpur

Message from Dr. Uday Shanker Dixit



I am very much delighted to know that NIT Jamshedpur is organizing an Online National Conference on “Research and Developments in Material Processing, Modelling and Characterization 2020” (RDMPMC2020). It is indeed a great idea to organize such type of online conference during the time of pandemic. This reflects the enthusiasm and zeal of faculty members of NIT Jamshedpur. I am also pleased that the technical papers will be published in proceedings by Springer. This will immensely help faculty members, research scholars and industry professionals of our country, as they are getting a suitable platform to disseminate their findings to global community. I am also aware that the conference organizing committee has arranged a few keynote lectures from eminent researchers. The keynote lectures will be of great benefit to the participants.

I am sure that this Conference will provide good platform for sharing the ideas, learning new techniques and making academic and professional connections. I congratulate the organizers of this conference and wish this conference a great success.



(Dr. Uday Shanker Dixit)

Professor,
Department of Mechanical Engineering
Indian Institute of Technology Guwahati

Conference Committee

Patron

Prof. Karunesh Kumar Shukla, Director, NIT Jamshedpur

Chairman

Dr. Ashok Kumar, Head of Department, Metallurgical and Materials Engineering, NIT Jamshedpur

Dr. Shashi Bhushan Prasad, Head of Department, Production and Industrial Engineering, NIT Jamshedpur

Secretary Organizing (s)

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Dr. Renu Kumari, Assistant Professor, Metallurgical and Materials Engineering, NIT Jamshedpur

Dr. Poulami Maji, Assistant Professor, Metallurgical and Materials Engineering, NIT Jamshedpur

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Mr. C. S. Choudhary, Assoc. Prof., Metallurgical and Materials Engineering, NIT Jamshedpur

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Dr. N. Yadhiah, NERIST, Assistant Professor, AP
Dr. Sateesh Kumar, Assistant Professor, NIT Trichy.

Conference Schedule

Day 1 (26 th August 2020)	
<i>9:00 am to 10:00 am</i>	Inauguration
<i>9:30 am to 10:00 am</i>	Prof. Partha Pratim Chattopadhyay , Director, NIFFT, Ranchi.
<i>10.00 am-10.30am</i>	Prof. Uday Shankar Dixit , Professor, Mechanical Engineering Department, IIT Guwahati
<i>10.30 am-11.00 am</i>	Sponsor 1 _Fine Tubes Limited, Plymouth, UK
<i>11:00 am to 1:00 pm</i>	Session 1 (5 Meets)
<i>1:00 pm to 2:00 pm</i>	Lunch
<i>2:00 pm to 2:30 pm</i>	Prof. Jyotsna Dutta Majumdar , Professor, MME, IIT Kharagpur
<i>2:30 pm to 3:00 pm</i>	Dr. Laxmidhar Besra , Chief Scientist, CSIR_IMMT.Bhubaneswar, Odisha, INDIA
<i>3.00 pm to 3.30 pm</i>	Sponsor 2 _ Gleeble Physical Simulation Dynamic Systems Inc.
<i>3:30 pm to 6:00 pm</i>	Session 2 (5 Meets)
Day 2 (27 th August 2020)	
<i>9:00 am to 10.00 am</i>	Prof. Rahul Mitra , Head of Department, MME, IIT Kharagpur
<i>10:00 am-10.30 am</i>	Dr. Swarup Bag , Associate Professor, Mechanical Engineering Department, IIT Guwahati
<i>10.30 am-11.00 am</i>	Prof. B.B. Jha , Visiting Faculty, MME NIT Jamshedpur
<i>11:00 am - 1:00 pm</i>	Session 3 (5 Meets)
<i>1:00 pm to 2:00 pm</i>	Lunch
<i>2:00 pm to 2:30 pm</i>	Dr. S. Tarafder , Chief Scientist, CSIR-NML, Jamshedpur
<i>2:30 pm to 3:00 pm</i>	Dr. C. P. Paul , Head Laser Division, Raja Ramanna Centre for Advanced Technology, Indore
<i>3:00 pm to 5:30 pm</i>	Session 4 (5 Meets)
<i>5:30 pm to 6:00 pm</i>	Votes of Thanks and Valedictory Function

RDMPMC-2020

Abstracts of National Conference on Research and Developments in Material Processing, Modelling and Characterization 2020



Editors

- Mayuri Baruah
- Renu Kumari
- Poulami Maji

RDMPMC-2020; 26-27 August, 2020



This book presents the Abstracts of the papers submitted to the Online National Conference on Research and Developments in Material Processing, Modelling and Characterization 2020 (RDMPMC-2020) held on 26th and 27th August 2020 organized by the Department of Metallurgical and Materials Science in Association with the Department of Production and Industrial Engineering, National Institute of Technology Jamshedpur, Jharkhand, India.

RDMPMC-2020 provided a platform to gather expert's opinions on advancements in Materials, Modelling, Characterization, and Manufacturing Processes. Featuring the Abstracts from the conference, this book will be brief of interest to experts in the various field whose work involves different domains of Materials, Metallurgical and Manufacturing Engineering.



Organized by
Department of Metallurgical and Materials Engineering

In Association with
Department of Production and Industrial Engineering

National Institute of Technology Jamshedpur, Jharkhand, India

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