

# Curriculum Vitae

**Dr. Utpal Basuli**



## **Contact Information:**

**Email:** [utpalbasuliiitkgp@gmail.com](mailto:utpalbasuliiitkgp@gmail.com)  
[ubasuli@gmail.com](mailto:ubasuli@gmail.com)

**Voice:** +918072478957 (Whatsapp) +919474183172, +918870242674,

**Permanent Address/Corresponding Address:** Dr. Utpal Basuli, At – Udichi Pratap Bagan (Uttar), P.O – Bankura, P.S – Bankura, PIN – 722101, Dist– Bankura, West Bengal, India

## **Personal Information:**

<b>Father's Name</b>	: Nalini Ranjan Basuli
<b>Mother's Name</b>	: Anjali Basuli
<b>Nationality</b>	: Indian
<b>Marital status</b>	: Married
<b>Date of Birth</b>	: April 9, 1979

## **Summary:**

Devoted researcher on Rubber and Polymer technology, excellent in fundamental knowledge, generating novel ideas, designing experiments and handling instruments, excellent knowledge for the rubber/rubber chemicals and raw materials and their applications interested in learning and solving problems, capable to work independently as well as in a group, productive and hard worker, sober, soft spoken, popular among the friends and teachers, have excellent reading, writing, speaking and presentation skills in English, Hindi and Bengali.

## **Career Objective:**

- Looking for a challenging and rewarding opportunity in the field of **Polymer Science and Rubber Technology/Rubber for Defence Application/Nano Science & Technology/Polymer Science & Composite Materials** across **Research & Development** which is in line with my **Academic & Research** background and **Industrial Experience**.
- Working with Industry and Academic Institute to solve the problem for the development of quality product and Improve quality and productivity.
- Excellent knowledge on **Six-Sigma, and others Quality Tool**.
- To succeed in an environment of growth and excellence and earn a job which provides job satisfaction and self development and help me achieve personal as well as organization goals and developments.

- To enhance the knowledge and implement the same in new challenging position.

## Summary of Research and Industrial Experiences:

### Senior Research Fellow (SRF):

- **BRNS-DAE**, Mumbai, India, from September 14, 2007 to September 13, 2009. Worked with research team at Rubber Technology Centre, IIT Kharagpur
- **CSIR-SRF**, New Delhi, India, from September 14, 2009 to August 31, 2011. Worked with research team at Rubber Technology Centre, IIT Kharagpur

### Post-doctoral Research Experience:

- From September 1, 2011 to August 31, 2012 postdoctoral fellow under the **World Class University (WCU) Research Team**, Department of Polymer-Nano Science and Technology, Chonbuk National University, Jeonju, 561-756, South Korea

### Industrial Experience/ Present Position:

- **Manager R & D (Belts & Oil Seal), J.K. Fenner (India) Ltd., India (From October 29, 2012 to August 30, 2017.**
- **Head General Manager Technical and R & D (Head R & D), Vinko Auto Industries Ltd., (Alaska Belts and Hoses) From October, 2017 to June 2018.**
- **Present Position: Head Manager- Rubber Technologist, Sujan Industries and Mega Rubber Technologies Pvt. Ltd., From May, 2020 to Till Date.**
- **Product Experience: Oil Seal, V-Belts, Sealing, Rubber to Metal Bonded Product, Vibration Isolation and Hoses etc**
- **The job role involved:** - (i) Development/design of rubber compound for Belts, Gasket, O-ring, Diaphragm and Oil Seal applications. Find out new application and alternate source of chemicals/Rubber/polymers. (ii) To keep sustained follow up for trials & development. (iii) Extend full - fledged support to Manufactures and Customers. Develop, document & continuously improve Quality Systems, Statistically analyze the quality performance for products and compounds. (iv) Lead the elastomeric compound Team for the development of Belts, Hose and Oil Seal compound in line with customer requirements. (v) Rubber to metal bonded products.

## Key Achievements:

- (1) Development of High Performance HNBR Timing Belts (Performance 3.0 Lac km).
- (2) Rubber for Defence Application (Trank Pad, Bush-Pin, Road Wheel for Battle Trank).
- (3) Knowledge for the Development of Railway Rubber Products.
- (4) Excellent Knowledge for the Rubber/Rubber Chemicals and Raw Materials and their Applications.
- (5) Belts for Nuclear Plant Application.
- (6) Developed Special Technique for the Reduction of Friction Co-efficient of Moulded Poly-V Belts.
- (7) Development of High Performance and Low Cost EPDM Based Poly-V Belts (Performance 1.0 Lac km) and NR/SBR Based V-Belts.
- (8) Development of EPDM Based Raw Edge Cogged (REC) Belts.
- (9) Development of Elastic Belt Based on EPDM for Automotive Applications
- (10) Development of Elastic Belt for Home Appliances.
- (11) Development of Oil Seal compounds by using High performance Rubber FKM, ACM.
- (12) Understand the customer requirements of Belts and Oil seals.
- (13) Development of Hoses based on EPDM, NBR, Silicone, NR/SBR, CR, FKM FVMQ etc.
- (14) Selection of chemical and additive for Belt and Oil Seal application.
- (15) Use of Design of Experiment (DOE) for the development of Rubber compounds.

## Academic and Educational Details:

### Academic Degrees:

- 1 **Doctor of Philosophy (Ph.D) from Indian Institute of Technology, Kharagpur in 2011** (2<sup>nd</sup> December, 2011). *Thesis title:* “Preparation and Properties of Nanocomposites Based on Poly(Ethylene-Co-Methyl Acrylate) and Multi-walled Carbon Nanotubes”.

### Education Details:

Name of the Examination Passed	Board / Council University	Year of passing	Class / Div. Obtained
Postdoc (Nanocomposites)	Chonbuk National University, South Korea	Sept 1, 2011 to Aug 31, 2012	-
Ph.D ( Nano-Technology in Polymer)	IIT Kharagpur	2011	-
M.Tech (Polymer Science & Rubber Technology)	IIT Kharagpur	2006	1 <sup>st</sup>
M.Sc (Chemistry) Organic Special.	Ranchi University	2004	1 <sup>st</sup>
B.Sc	Vidyasagar University	2001	2 <sup>nd</sup>
H.S (10+2)	W.B.C.H.S.E	1997	2 <sup>nd</sup>
M.P (+10)	W.B.B.S.E	1995	1 <sup>st</sup>

## Master Student Guided: 1

**Thesis title:** “Investigation of Cure Characteristic and Physico-Mechanical Properties of Ethylene Propylene Diene Monomer (EPDM) Based Elastomeric nanocomposites” Submitted in 2014 to Anna University, India.

## Academic Honors/Awards:

- **GATE-2004** in CY (Chemical Sciences), **All India Rank-225** (With Percentile 93.05)
- **NET -2004** June (Lectureship)
- **CSIR-SRF-2009** CSIR, New Delhi
- **Best poster award** in Research Scholar Day-2011, at Rubber Technology Centre, IIT Kharagpur
- **Best poster award** in International Rubber Conference (IRC-2012), at Jeju, Republic of Korea
- **Best paper award** in 2nd International Conference On Robust Quality Engineering (ICRQE-2014), Bangalore, India

## Relevant Courses Undertaken:

M.Tech	
<ul style="list-style-type: none"><li>• Industrial Rubber-I</li><li>• Rubber Compounding &amp; Reinforcing Materials</li><li>• Basic Rubber Science</li><li>• Physical Testing of Rubbers</li><li>• Latex and Foam Technology</li><li>• Seminar-I</li><li>• Rubber Laboratory –I</li></ul>	<ul style="list-style-type: none"><li>• Rubber Product Manufacturing Technology</li><li>• Industrial Rubber-II</li><li>• Adhesion Science &amp; Technology</li><li>• Characterization of Rubber &amp; Rubber Like Materials</li><li>• Tire Technology</li><li>• Comprehensive Viva Voce</li><li>• Seminar-II</li><li>• Rubber Laboratory –II</li></ul>
M.Sc	
<ul style="list-style-type: none"><li>• Organic Chemistry</li><li>• Inorganic Chemistry</li><li>• Physical chemistry</li><li>• Spectroscopy</li><li>• Environmental Chemistry</li><li>• Organic Laboratory-I</li><li>• Inorganic Laboratory-I</li><li>• Physical Laboratory-I</li></ul>	<ul style="list-style-type: none"><li>• Organic Chemistry</li><li>• Reagents and Synthesis</li><li>• Bio-chemistry</li><li>• Natural Product</li><li>• Industrial Chemistry</li><li>• Organic Laboratory-II</li><li>• Organic Laboratory-III</li><li>• Industrial Laboratory-1</li></ul>

## Research Fellowships/Scholarships:

- **GATE**, MHRD, India, from July 2004 to June 2006
- **BRNS-DAE**, Mumbai, India, from September 14, 2007 to September 13, 2009.
- **CSIR-SRF**, New Delhi, India, from September 14, 2009 to August 31, 2011
- **Post-doc, World Class University (WCU)** Republic of Korea, from September, 2011 to August, 2012.

## Instrumental Expertise/Skills:

Scanning electron microscope (SEM), Transmission electron microscope (TEM), X-ray photoelectron spectroscopy (XPS), X-ray diffractometry (XRD), Hall effect measurement, LCR meter, Multimeter, Infrared (IR) spectroscopy, Ultraviolet visible (UV) spectroscopy, Rubber process analyzer (RPA), Zwick/Roell Z005, Hounsfield, Universal Tensile testing machine (UTM) (Zwick, Hounsfield), Differential scanning calorimetry (DSC) (TA Q100), Thermogravimetric analysis (TGA) (TA Q50), Dynamic mechanical analysis (DMA), Dielectric analyzer (DEA), Monsanto processability tester (MPT), Rheometer, Viscometer, Durometer Hardness, duPont and DIN Abrader, Processing Machines-Two roll mixing mill, Molding Press (Moore), HAAKE Rheomix, Brabender, Banbury and K-4 Intermix. **Having knowledge on Rubber compounding/ Compound Development and Application of Specialty Elastomers/ DOE, Six-Sigma, Minitab 17, QMS etc.**

## Experience/Industrial Skills:

- Good knowledge & experience on Manufacturing Process (Rubber Mixing, Rubber compression, Rubber Molding, Strong planning knowledge) Expertise in rubber domain.
- Compounding knowledge on NR, SBR, EPDM, NBR, HNBR, ACM AEM, FKM and CSM Rubbers.
- To carry out trials for development of new products as well as existing products.
- Adequate knowledge of business and management principles (budgeting, strategic planning, resource allocation).
- Should be involved in product mixing, compounding, & testing activity.
- Facing system audits and customer audits for system compliance.
- Conducting Cost-Reduction Trial by coordinating with Technical & Purchase departments.
- Overall Responsible with Value Engineering Project in Plant.
- Coordinate with all department of the organization for improving productivity.
- Monitor & control Production related tasks including planning, procurement, control & Trouble shooting for achieving the planned periodic Schedules.
- Installation of cost saving measures and modifications to achieve substantial reduction in terms of man- days, production cost, raw material.
- To organize and carry out Inspection and Testing of the raw-materials and finished products as per the Quality plans.
- To issue Test Certificates for the dispatches to the Customers.
- Maintain close coordination with Design, Tool Room, Purchase, Quality, Logistics & sales team. Skills And Abilities: Leadership Skills, Man management skills, Great communication, organization skills, must be proactive

## List of publications:

**Book chapter:1**

**International Journals: 18**

**International conferences: 15**

**National conferences: 4**

### *Book chapter:*

1. **Utpal Basuli**, Sudipta Panja, Tapan Chaki and Santanu Chattopadhyay “Preparation, Properties, and Processibility of Nanocomposites Based on Poly(ethylene-Co-Methyl Acrylate) and Multi-walled Carbon Nanotubes" in Handbook of Polymer nanocomposites” entitled “Processing, Performance and Application - Volume B” by Springer 2014.

### *International Journals*

1. **U. Basuli**, T.K. Chaki, and K. Naskar, “Thermoplastic vulcanizates (TPVs) based on silicone rubber and ethylene butene copolymer: study at a fixed blend ratio”, Rubber, Plastics and Recycling Technology **2007**, 23 (4), 209-226. *Impact Factor: 0.3*
2. **U. Basuli**, T.K. Chaki, and K. Naskar, "Mechanical Properties of Thermoplastic Elastomers Based on Silicone Rubber and an Ethylene-Octene Copolymer by Dynamic Vulcanization” Journal of Applied Polymer Science **2008**,108, 1079-1085. *Impact Factor: 1.203 (2010)*
3. **U. Basuli**, T.K. Chaki, and K. Naskar, "Influence of Engage<sup>®</sup> Copolymer Type on the Properties of Engage<sup>®</sup>/Silicone Rubber–Based Thermoplastic Dynamic Vulcanizates” eXPRESS Polymer Letters **2008**, 2(12), 846–854. *Impact Factor: 1.452 (2010)*
4. P.K. Chattopadhyay, **U. Basuli**, S. Chattopadhyay, “Studies on Novel Dual Filler based Epoxidized Natural Rubber Nanocomposite” Polymer Composites **2010**, 31, 835-846. *Impact Factor: 1.195 (2010)*
5. **U. Basuli**, T.K. Chaki, S. Sabarwal and S. Chattopadhyay, “Thermal and Mechanical Properties of Polymer-nanocomposites Based on Ethylene Methyl Acrylate and Multiwalled Carbon Nanotube” Polymer Composites **2010**, 31, 1168-1178. *Impact Factor: 1.195 (2010)*
6. **U. Basuli**, T. K. Chaki, and S. Chattopadhyay “Influence of Acrylate Content on the Properties of Ethylene Methyl Acrylate-Multi Walled Carbon Nanotube Composites” Advanced Science Letters **2010** 3, 10–19. *Impact Factor: 1.3 (2010)*
7. **U. Basuli**, T. K. Chaki, S. Chattopadhyay “Rheological Signatures of Ethylene Methyl Acrylate-Multi Walled Carbon Nanotube Nanocomposites” Polymers for Advanced Technologies **2012**, 23, 65-76. . *Impact Factor: 1.776 (2011)*
8. **U. Basuli**, T. K. Chaki, S. Chattopadhyay “Thermo-mechanical and Rheological Behavior of Polymer Nanocomposites Based on Ethylene-Methyl Acrylate (EMA) and Multiwalled Carbon Nanotube (MWNT)” Plastics, Rubber and Composites:

Macromolecular Engineering **2011**, 40, 213-222. *Impact Factor* **0.3 (2010)**

9. **U. Basuli**, T. K. Chaki, D. K. Setua, S. Chattopadhyay “A comprehensive assessment on degradation of multi-walled carbon nanotube-reinforced EMA nanocomposites” Journal of Thermal Analysis and Calorimetry (JTAC) **2012**, 108, 1223-1234 DOI 10.1007/s10973-011-1652-0. *Impact Factor: 1.752 (2010)*
10. **U. Basuli**, T. K. Chaki, S. Chattopadhyay "Mechanical, Thermal and Rheological Behavior of Ethylene Methyl Acrylate-MWNT Nanocomposites" Polymer Engineering & Science **2012**, 52, 277-288 DOI 10.1002/pen.22081. *Impact Factor: 1.296 (2011)*
11. **U. Basuli**, S. Chattopadhyay, C. Nah, T. K. Chaki “Electrical Properties and Electromagnetic Interference Shielding Effectiveness of Multi-Walled Carbon Nanotubes-Reinforced EMA Nanocomposites” Polymer Composites 33, 897-903 (**2012**) *Impact Factor: 1.195 (2012)*
12. **U. Basuli**, T. K. Chaki, C. Nah, S. Chattopadhyay “Rheological Behaviors and Electrical Properties of Nanocomposites Based on Poly(Ethylene-Co-Methyl Acrylate) and Multi-walled Carbon Nanotubes” Advanced Science Letters 17, 27-39 (**2012**) *Impact Factor: 1.253 (2011)*
13. H. D. Chae, **U. Basuli**, J. H. Lee, C. I. Lim, R. H. Lee, S. C. Kim, N. D. Jeon, C. Nah “Effect of dual filler (Zinc methacrylate and Carbon black) on mechanical properties of a rubber compound” Polymer Composites 33, 1141-1153 (**2012**) *Impact Factor: 1.195 (2012)*
14. **U. Basuli**, J. Jose, J.Y. Kim, I. W. Kim, C. Nah “Properties and degradation of the gasket component of a proton exchange membrane fuel cell - A Review” Journal of Nanoscience and Nanotechnology 12, 7641-7657 (**2012**) (*Impact Factor: 1.44 (2012)*)
15. **U. Basuli**, S. Kim, A. N. Gent, C. Nah “Preparation and Characterization of Flexible and Stretchable Polymeric Magnet” Asian Journal of Chemistry 25, 5181-5184 (**2013**)
16. S. Kim, **U. Basuli**, R. H. Lee, A. N. Gent, C. Nah, “Preparation and morphological characteristics of fluoroelastomer electrospun fibers” Asian Journal of Chemistry 25, 5195-5199 (**2013**)
17. R. H. Lee, **U. Basuli**, M. Y. Lyu, E. S. Kim, C. Nah “Fabrication and performance of a donut-shaped generator based on dielectric elastomer” Journal of Applied Polymer Science **2014**, 131, 40076. *Impact Factor: 1.203 (2010)*
18. **U. Basuli**, E. Palaninathan, T. K. Chaki, S. Chattopadhyay, Effect of Plasma, Gamma and Chemically Surface Modified MWNTs on the Rheological and Electrical Properties of Ethylene Methyl Acrylate (EMA) Nanocomposites” Journal of Nanoscience and Nanotechnology, 18 (7), 4621-4633 (**2018**)



### *International conferences*

1. K. Naskar , **U. Basuli** and T. K. Chaki “Development of Novel Thermoplastic Elastomers Based on Silicone Rubber by Dynamic Vulcanization” Indian Rubber Institute, International Seminar-Asia Rubtech Expo 2006, during November 23-25, **2006** at Kerala, India.
2. **U. Basuli**, T.K. Chaki, and K. Naskar, “Mechanical Properties of Thermoplastic Elastomers Based on Silicone Rubber and Engage Copolymer by Dynamic Vulcanization” Presented in International Conference on Rubber and Rubber-like Materials 2008 (ICRRM-2008) during January 8-10, **2008** at IIT Kharagpur, India.
3. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay “Flexible Composites based on EMA and Modified Conducting Carbon Black”, Presented in India Rubber Expo 2009 (IRE-2009) during January 28-31, **2009** at Kolkata, India.
4. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay “Morphology and thermal properties of solution and melt-mixed multi-walled carbon nanotube/ EMA nanocomposites: a comparative study” Presented in Polymer Processing Society (PPS - 25) during March 1 -5, **2009** at Goa, India.
5. T.K. Chaki, **U. Basuli** and S. Chattopadhyay “Morphology, Thermal and Mechanical Properties of Polymer Nanocomposites Based on Ethylene Methyl Acrylate and Multiwalled Carbon Nanotube” Second Conference on Recent Advances in Polymer Technology (RAPT- 2009) during December 28-29, **2009** at Jalgaon, India
6. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay “Thermo-mechanical, Electrical and Morphological Characteristics of Ethylene Methyl Acrylate (EMA)/CNT Nanocomposites” 2nd Indo Swiss Bonding International Symposium **2010**, presented during February 11-13, 2010, at Sikkim Manipal University (SMU), Sikkim, India.
7. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay “Rheological and Thermal Behavior of Ethylene Methyl Acrylate-Multi Walled Carbon Nanotube Composites” Advancements in Polymeric Materials (APM-2010), presented during February 20-22, **2010**, at Central Institute of Plastics Engineering & Technology (CIPET), Bhubaneswar, Orissa, India.
8. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay “Studies on Nanotube Networks in Polymer Nanocomposites by Dynamic and Steady Shear Rheology” Processing and Fabrication of Advanced Materials XIX (PFAM- XIX), present during January 14-17, **2011** at Auckland, New Zealand.
9. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay “Polymer–Nanosilica–Carbon Nanotube Nanocomposites: Unique Nanofiller Synergistic Effect” International conference on Advances in Polymer Science and Rubber Technology (APSRT), present during March 3-5, **2011** at IIT Kharagpur, India.
10. **U. Basuli** and C. Nah, “Functionalizing Multi-wall Carbon Nanotubes by Plasma Modification for the Preparation of High Performance Ethylene Methyl Acrylate (EMA)



Nanocomposites” International Conference and Workshop on Nanostructured Ceramics and other Nanomaterials (ICWNCN)” during March 13-16, **2012** at New Delhi, India.

11. **U. Basuli**, S. Kim, A. N. Gent, C. Nah, “Preparation and Characterization of Flexible and Stretchable Polymeric Magnet” International Rubber Conference (IRC-2012) during May 20-24, **2012** at Jeju, Republic of Korea.
12. S. Kim, **U. Basuli**, B. Mensah, J. H. B, R. H. Lee, A. N. Gent, C. Nah, “Preparation and Properties of Sulfonated Fluoroelastomer based Stretchable Membrane” International Rubber Conference (IRC-2012) during May 20-24, **2012** at Jeju, Republic of Korea.
13. J. H. Lee, H. D. Chae, **U. Basuli**, C. I. Lim, S. C. Kim, N. D. Jeon, C. Nah, “Mechanical and Thermal Properties of Rubber Nanocomposites Reinforced by Zinc Methacrylate and Carbon Black” International Rubber Conference (IRC-2012) during May 20-24, **2012** at Jeju, Republic of Korea.
14. S. Mahesha, B. Stalina, **U. Basuli**, Effect of Carbon Black and Nanosilica on Structure Properties of Hydrogenated Acrylonitrile Butadiene (HNBR) Rubber, International Conference- 2014 February 2014 Alagappa University, India
15. **U. Basuli**, S. Majumdar, P. Bhaiswar “Design Performance Modelling for Simulated Optimization for Rubber Compounding” 2nd International Conference On Robust Quality Engineering, December 15 - 17, 2014, Bangalore, India.

#### *National conferences*

1. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay, C. Nah “Morphology, Thermo-mechanical and Electrical Properties of Nanocomposites Based on Ethylene Methyl Acrylate and Multi-walled Carbon Nanotubes” National Rubber Conference-2011, presented on 4<sup>th</sup> November, **2011**, South Korea.
2. **U. Basuli**, T.K. Chaki, and S. Chattopadhyay, S. Kim, A. N. Gent, C. Nah “Synergistic Effect of Hybrid Carbon Nantube-Nanosilica in Enhancing the Electrical and EMI Shielding Effectiveness Properties of EMA Nanocomposites” The Polymer Society of Korea, during April 12-13, **2012**, pp 70, South Korea.
3. S. Kim, **U. Basuli**, A. N. Gent, C. Nah “Electrospinning of FKM”, The Polymer Society of Korea, during April 12-13, **2012**, pp 72, South Korea.
4. S. Mahesh, B. Stalin, **U. Basuli**, Investigation of Cure Characteristic and Physico-Mechanical Properties of Ethylene Propylene Diene Monomer (EPDM) Based Elastomeric nanocomposites, April 2014 Anna University, India

### Other Relevant Information:

#### Hobbies/Interests

- a) Drawing and Painting,
- b) Recitation

#### Language Known

- (a) English (b) Bengali (c) Hindi

#### Mother Tongue

- a) Bengali

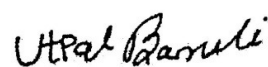
All the above information given by me is in all respect

### References

**1. Prof. Santanu Chattopadhyay**, Rubber Technology Centre, Indian Institute of Technology, Kharagpur-721302, India, Tel: +91-3222-281758, Fax: +91-3222-282292, E-mail: [santanu@rtc.iitkgp.ernet.in](mailto:santanu@rtc.iitkgp.ernet.in) (**PhD Supervisor**).

**2. Prof. Changwoon Nah**, Department of Polymer-Nano Science and Technology, Chonbuk National University, 664-14 Duckjin-dong, Duckjin-gu, Jeonju 561-756, Republic of Korea Tel: +82-63-270-4281 Fax: +82-63-270-2341, E-mail: [cnah@jbnu.ac.kr](mailto:cnah@jbnu.ac.kr) (**Post-Doctoral Supervisor**).

**3. Prof. Kinsuk Naskar**, Rubber Technology Centre, Indian Institute of Technology, Kharagpur-721302, India, Tel: +91-3222-281748, Fax: 91-3222-282292, E-mail: [knaskar@rtc.iitkgp.ernet.in](mailto:knaskar@rtc.iitkgp.ernet.in) (**MTech Project Supervisor**).



Signature of the candidate