Curriculum Vitae

Ms. Kirty Madhavi
M.Tech, IIT Bombay
Assistant Professor
Department of Metallurgical Engineering
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ACADEMIC EXPERIENCE

Assistant Professor, Metallurgical Engineering, BIT Sindri *[Jan'22-Present]*

- **Subjects taught –** Mechanical Behaviour of Materials, Material Characterization, Fuels Refractories and Furnaces and Materials Engineering
- **Labs –** Computational Engg. Lab, Mechanical Testing Lab, Material Characterization Lab, Fuels Refractories and Furnaces Lab

INDUSTRIAL EXPERIENCE

Process Control Cell, JSW Steel Ltd. Dolvi Works, Deputy Manager *[Apr'21-Jan'22]*

- Daily Monitoring the critical process parameters for the production of Thermo-mechanically treated(**TMT) rebar** from **Bar-mill** and **Hot rolled coils** from Compact Strip (**CSP) mill**

Research & Development, JSW Steel Ltd. Dolvi Works, Assistant Manager *[Sep'16-Mar'21]*

Project 1: Mathematical modelling of thin slab hot rolling for C-Mn steel

- Developed a model to determine the austenite grain size and Mean Flow Stress at each stand
- Application in developing new grades of steel

Project 2: Modelling for temperature history and phase transformation occurring in TMT rebar during QST process

- Developed a heat transfer model for TMT rebar during QST process
- Developed a phase transformation model to predict the mechanical properties of TMT rebar

Project 3: Development of cost-effective seismic resistant IS 1786: 2008 Fe 500S TMT rebar

- Developed Fe 500S TMT rebar in 10-40mm diameter through C-Mn route without micro-alloying
- Application in earthquake resistant reinforcement concrete structure

Project 4: Development of high strength IS 1786: 2008 Fe600 TMT rebar

- Developed Fe600 TMT rebar in 8-40mm diameter through C-Mn route
- Developed Fe600 TMT rebar in 8-32mm diameter through C-Mn with Nb as micro-alloy and filed apatent for better uniform elongation (Indian Patent Application No. 201721045298)

Project 5: Alloy redesign of Fe 500D grade TMT rebar to reduce cost of alloying

- The Manganese and the Silicon in the billet chemistry were reduced by reducing the Silico-manganese (SiMn) and Ferro-silicon(FeSi) alloy addition during secondary steel making
- Estimated potential cost saving due to the reduction in SiMn and FeSi is around Rs.210 per ton of thermo-mechanically treated rebar

Project 6: Development of regression model to predict the mechanical properties of HR Coils from given chemistry and process parameters produced through CSP route

- Developed a model to predict the mechanical properties of Hot Rolled Coils based on the previous data of the CSP mill

- Application in designing the steel chemistry and process parameter based on the mechanical properties requirement to reduce the number of trials taken for the new product development

Patent Research:

- **Drafting** patent applications and reviewing the patent drafts in the domain of metallurgy
- National Patent Filing
- Successfully completed the one-year program of **Post Graduate Diploma in Patent Laws** from **NALSAR University, Hyderabad** *[Sep'19-Oct' 20]*
- Granted **1 copyright** and **2 patents** in the Indian Patent Office

Procurement:

- Material management for R&D section using **SAP MM Module** that includes item code creation (using **KADMS**), Purchase Requisition, Vendor evaluation and material inspection
- Material tracking and follow up with Purchase dept. and vendors
- Processing service and supply bills of the supplier

PATENTS, PUBLICATIONS & CONFERENCES

- Madhavi K; Phase Transformation Model to Predict the Phases Formed After Quenching in the TMT Steel Bar. **Indian Copyright Registration No.** SW-14450/2021. 2020 Dec 16
- Madhavi K, Sam S, Deshmukh B; High strength Cold Rolled Galvanized Steel Sheet and Methods of it Manufacture. **Patent No.530340. Indian Patent Application No. 201921048394**. 2019 Nov 26
- Patra PK, Sam S, Madhavi K, Singh TK; High Strength Thermo-Mechanically-Treated (TMT) Rebars Having Yield Strength of 600MPa (Min) and a Process for Its Production. **Patent No.499299. Indian Patent Application No 201821026906**. 2017 Dec 16
- Sam S, Madhavi K, Patra PK; Development of cost effective seismic resistant Fe500S TMT rebar through QST process for RCC structure in earthquake prone area. **Steel Tech** 2018, 12, 4, pp 32-36
- Madhavi K, Sam S, Patra PK; Development of High Strength TMT Rebar through QST Process for Structural Applications; **Advances in Engineering Material for Sustainable Development**; 2019 Jan 18- 19; The Institute of Engineers; Jamshedpur local center, Jharkhand, India

KEY ACADEMIC PROJECT

- **M. Tech Project: Modelling of carburization of alloy steel** *[Jun'15-Jun'16]*

  Guide: Prof. N. N. Viswanathan and M. P. Gururajan (Professor, Dept. of MEMS, IIT Bombay)

  Objective: *To study the effect of carbide formation on the diffusivity of carbon*

- Developed a model for the carburization of plain carbon steel and extending it to alloy steel to studythe effect of different carbide forming alloying elements using C programming
- Application in automobile industries to improve the microstructural property and to enhance thefatigue life of gears and shafts

TRAINING INTERNSHIP AND CERTIFICATION

- Completed **6 months** of **FDP** on mandatory 8 modules organised by the NITTTR, 2023
- Completed **2 weeks** of **FDP** on Data Science and AI for Non-Programmers using momentum organised by department of CSE and IT, BIT Sindri in association Accure Pvt ltd, 2023
- Completed **1 week FDP** on "Service Regulations for Employees" organised by BIT Sindri, 2022
- Completed the **8 days training** on **Data Analytics** organised by **MATHWORKS,** 2021
- Completed **6 Sigma yellow belt** certification course organised by **Skillsoft,** 2021
- Completed in the short course on **Hot Rolling of Steels** organised by IIT Bombay and Coest, 2019
- Completed **project training** of **4 weeks** on comparative study of effect of niobium,deformation and normalizing on tensile properties of high strength steels using UTM, **RDCIS SAIL, RANCHI** 2014

- Successfully completed a **vocational training** of **4 weeks** and visited the Raw Material Handling Plant, Sintering Plant, Blast Furnace, Coke Oven, Steel Melting Shop and Finishing Shops, **SAIL, BOKARO,** 2012

INSTRUMENT & SOFTWARE SKILLS

- **Instruments Proficiency:** Optical Microscope & Micro Hardness Testing
- **Languages and Software Packages:** C, HTML, MATLAB, JMatPro, Minitab

POSITIONS OF RESPONSIBILITY

- **Undergraduate Student Coordinator, Extra Curricular Activities (Dhatvika, Alchemy etc.) Metallurgical Engg., BIT Sindri** *[Jan '22 – Present]*
- **Member, Complaint Cell, BIT Sindri** *[Jan '22 – Present]*
- **IQAC Departmental Coordinator, Metallurgical Engg., BIT Sindri** *[Jan '22 – Present]*
- **IPR Activity coordinator, Institution's Innovation Council (IIC) BIT Sindri** *[Jan '23 – Present]*
- **TQM Coordinator, R&D, JSW Dolvi** *[May '18 – Mar'21]*
- **Academic Unit Representative for Academic Affairs, IIT Bombay** *[Jul '15- June '16]*
- **Institute Student Companionship Program, IIT Bombay** *[Jul '15- June '16]*
- **Vice president, Painting Wing Club, B.I.T. Sindri** *[Jan '10-Mar '13]*

SCHOLASTIC ACHIEVEMENTS

- Secured an **AIR-79**, in **GATE-2014**, Metallurgical engineering
- Secured **1st class** with distinction in B.tech, Metallurgical Engineering Department, B.I.T. Sindri *[2009-13]*

Examination	University	Institute	Year	CPI/%
Post Graduation	IIT Bombay	IIT Bombay	2016	8.46
Undergraduate Specialization: Metallurgical Engineering				
Graduation	Vinoba Bhave University	B.I.T. Sindri	2013	78.40
Intermediate/+2	CBSE	Dhanbad Public School	2008	82.00
Matriculation	CBSE	D.A.V. Public School	2006	92.20

EXTRA-CURRICULAR ACTIVITIES AND INTERESTS

Activities:

- **Participated** in the **Conference** on "The Challenges and Opportunities in Steel Industry in Indian context- Focus on Capital Goods (ICONS 24)" at Mecon Limited, Ranchi, Jharkhand, 2024
- **Organised** a **3-day** technical event "Dhatvika- 24", Metallurgical Engineering, BIT Sindri, 2024
- **Organised** a **1 week workshop** on "Advances in Agglomeration Processes in Iron Making-2023" AAPIM, Metallurgical Engineering BIT Sindri, 2023
- **Organised a 3-day** technical event **"**TechUtsav", Metallurgical Engineering BIT Sindri, 2023
- **Participated** in the **1-week workshop** on "Advances in Materials, Processes and Characterization-2023" AMPC organised by Metallurgical Engineering BIT Sindri, 2023

- **Participated** in the **1-day workshop** on "NEP (National Higher Education Qualification Framework O(NHEQFs) and Higher Education Institution (HEIs)) at B.I.T. Sindri, 2023
- **Participated** in the **3 days** "International Symposium on Enrepreneurship in the Digital Era -2022" (ISEDE-2022) organized by Entreprenerur Cell (E-Cell), BIT Sindri in association with BITSAA, 2022
- **Organised** a **1-day** workshop on IPR awareness/training program under the special mission called "National Intellectual Property Awareness Mission (NIPAM)" at B.I.T. Sindri, 2022
- Have been selected for the **Springboard**, (Women Leadership Program of JSWGroup) organised by **IIM Bangalore**, 2021
- Was in the **top 75 finalist** in the Data Science Program organised by **JSW Group** and **MATLAB,** 2021
- Secured **first** position in the Annual Environment **quiz** competition organised by Environment department of JSW Steel Dolvi, 2017
- Attended a workshop of **5 days** on **MATCALC** jointly organised by TATA Steel and I.I.T. Madras, 2015
- Participated in national online quiz organised by **Padarth, IIT Bombay,** 2015
- Secured **first** position in the **Ramp Walk** competition organised by the Rotaract Club of B.I.T., 2010

Interests: **Kathak** classical dance and **Swimming**