**Ms. Kirty Madhavi**
**M.Tech, IIT Bombay**
**Assistant Professor**
**Metallurgical Engineering, BIT Sindri**
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**Mobile No.: 8451850885**
**DOB: 06/03/1990**

## ACADEMIC EXPERIENCE

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

- **Subjects taught –** Mechanical Behaviour of Materials, Material Characterization
- **Labs –** Computational Engg. Lab, Mechanical Testing of 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 a patent 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]*
- Filed **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 suppliers

## 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. **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. **Indian Patent Application No. 201721045298**. 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 centre, 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 study the effect of different carbide forming alloying elements using C programming
  - Application in automobile industries to improve the microstructural property and to enhance the fatigue life of gears and shafts

## TRAINING INTERNSHIP AND CERTIFICATION

- **SAIL, BOKARO:** 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
- **RDCIS SAIL, RANCHI:** Underwent a project training of **4 weeks** on comparative study of effect of niobium, deformation and normalizing on tensile properties of high strength steels using UTM
- **Successfully** completed the **8 days** training on **Data Analytics** organised by **MATHWORKS,** 2021

## INSTRUMENT & SOFTWARE SKILLS

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

## POSITIONS OF RESPONSIBILITY

- **Dhatvika Coordinator, Metallurgical Engg., BIT Sindri** *[Jan '22 – Present]*
- **IQAC Departmental Coordinator, Metallurgical Engg., BIT Sindri** *[Jan '22 – 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 Programme, 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:**

- Have been selected for the **Springboard**, (Women Leadership Program of JSW Group) organised by **IIM Bangalore**, 2021
- Was in the top **75 finalist** in the Data Science Program organised by **JSW Group** and **MATLAB,** 2021
- Successfully completed **6 Sigma yellow belt** certification course organised by **Skillsoft,** 2021
- Attended the short course on **Hot Rolling of Steels** organised by IIT Bombay and Coest, 2019
- 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**