

MUHAMMAD ANWARUL NAZIM

602 E 12th St., Apt. B, Rolla, MO - 65401

(573) 647 - 3821 • manck8@mst.edu

EDUCATION

- **Doctor of Philosophy in Materials Science and Engineering** **03/2026**
Missouri University of Science and Engineering, Rolla, MO, USA
Dissertation title: "Continuous Casting Mold Simulator to Characterize Meniscus Behavior and Mold Flux Properties"
CGPA: 4.00/4.00 **(Expected)**
- **Master of Science in Metallurgical Engineering** **04/2017**
RWTH Aachen University, Aachen, Germany
Major: Material Science of Steels
CGPA: 2.20 (German Scale- max: 1.00 min: 4.00), US Equivalent: 3.39/4.00
- **Bachelor of Science in Mechanical Engineering** **10/2012**
Chittagong University of Engineering and Technology, Chattogram, Bangladesh
CGPA: 3.49/4.00 (Class position: 9th out of 120)

RESEARCH EXPERIENCE

- **Graduate Research Assistant: The Peaslee Steel Manufacturing Research Center (PSMRC)** **06/2022-Present**
Department of Materials Science and Engineering, Missouri University of Science and Technology, Rolla, MO, USA.
Advisor: Prof. Dr. Ronald O'Malley
 - Modify existing dip tester to incorporate casting parameters to simulate industrial continuous casting process in lab scale.
 - Design and implement optical fiber-based mold using the Rayleigh Backscattered Technology to investigate various steel grades and mold fluxes.
 - Evaluate oscillation practice and mold flux impact on mold heat transfer and shell growth for peritectic steel grades.
 - Model and predict shell growth based on the temperatures measured by optical fiber.
 - Investigate effect of hydrogen in steel on mold heat transfer and shell growth for different mold flux systems.
- **Summer Internship: Process Innovation Engineer** **06/2024-08/2024**
Department of Process Innovation, The US Steel Research and Technology Center, Munhall, PA, USA.
 - Worked on the improvement of existing mold simulator setup.
 - Investigated on initial steel shell solidification by using thermocouple and optical fiber-based mold simulator experiments.
 - Researched on Si and Mn sensitivity on AHSS grade peritectic steel casting.
 - Worked on various tools and softwares to characterize the steel shell and the mold flux film for heat transfer analysis.
 - Hands-on training and unsupervised operation of advanced thermoanalytical equipments (DSC, CLSM) to characterize steel and mold flux samples.
- **Master's Thesis** **10/2016-03/2017**
Materials Simulation Group, Department of Ferrous Metallurgy, RWTH Aachen University, Aachen, Germany
Title: Experimental and numerical investigation upon the dependence of yield strength and

hardening of dual phase steels on various temperatures and strain rates.

Advisor: Prof. Dr. W. Bleck

- Investigated on high temperature formability of DP1000 steel grade by conducting high temperature tensile tests and using ABAQUS numerical simulations.
- From the simulation and experimental results, optimum industrial forming process parameters for DP1000 were selected.

- **Internship**

Product Management Department, ISRA VISION PARSYTEC AG, Aachen, Germany

10/2015-03/2016

Title: Constructing a new and upgrading existing steel surface defect catalogs.

- Formulated a technical catalog based on defects generated in steel's various process lines incorporated with thorough information about common defects from metallurgical point of view.

- **Study Integrated Thesis**

Materials Simulation Group, Department of Ferrous Metallurgy, RWTH Aachen University, Aachen, Germany

04/2015-05/2015

Title: Literature study on thermo-mechanical modeling of quenching-induced phase transformations and associated distortion.

- Conducted a literature review based on modeling and simulation of improved phase transformation kinetic models in predicting distortion and residual stresses of quenched steel part.

- **Mini Research Project**

Materials Simulation Group, Department of Ferrous Metallurgy, RWTH Aachen University, Aachen, Germany

01/2015-02/2015

Title: Simulation of precipitates in creep resistance steel grade P91.

- Conducted a simulation of phase precipitation of P91 steel grade by using Thermo-calc: 4.1.

- **Bachelor's Thesis**

Department of Mechanical Engineering, Chittagong University of Engineering and Technology, Chattogram, Bangladesh

04/2012-09/2012

Title: Uncertain demand and supply based inventory control system treating with MATLAB fuzzy logic.

- Designed a smart inventory control system based on MATLAB fuzzy toolbox to quantify order and reorder point considering uncertainties of supply and demand in operation management.

TEACHING AND MENTORING EXPERIENCE

- **Teaching Assistant: Mechanical Testing of Materials, MET 3125**

Fall 2023 & Fall 2024

Department of Materials Science and Engineering, Missouri University of Science and Technology, Rolla, MO, USA.

- Supervised and conducted lab classes and experiments of basic mechanical tests in Materials Science and Engineering for 20-25 senior level undergraduates.
- Graded course assessments to ensure students understood materials and stayed on track.

RESEARCH GRANTS

- **The Peaslee Steel Manufacturing Research Center (PSMRC), "Continuous Casting Mold Simulator to Characterize Meniscus Behavior", \$378,762.00**

07/2022-12/2025

PUBLICATIONS

ResearchGate Profile: <https://www.researchgate.net/profile/Muhammad-Anwarul-Nazim>

- **Nazim, M.;** Buchely, M.; Emdadi, A.; Huang, J.; Saha, R. K.; O'Malley, R., "A Lab-Scale Mold Simulator Employing an Optical-Fiber-Instrumented Mold to Characterize Initial Steel Shell Growth Phenomena," In proceedings of the AISTech, Columbus, USA, 2024, 947–958. doi: 10.33313/388/100. Conference paper.
- **Nazim, M.A.;** Emdadi, A.; Sander, T.; O'Malley, R. The Effect of Mold Flux Wetting Conditions with Varying Crucible Materials on Crystallization. *Materials* 2025, 18, 1174. <https://doi.org/10.3390/ma18051174>. Peer reviewed article.
- **Nazim, M.;** Buchely, M.; Emdadi, A.; Huang, J.; Saha, R. K.; O'Malley, R., "A Lab-Scale Mold Simulator Employing an Optical-Fiber-Instrumented Mold to Characterize Initial Steel Shell Growth Phenomena: Experimental Development," *AIST Transactions, Iron & Steel Technology*, May 2025, Vol. 22, No. 4, pp. 386-397. DOI 10.33313/TR/0525.. Peer reviewed article.

CONFERENCE PRESENTATIONS

• Oral Presentations:

- **Nazim, M.** (May, 2024) "A Lab-Scale Mold Simulator Employing an Optical-Fiber-Instrumented Mold to Characterize Initial Steel Shell Growth Phenomena," Continuous Casting Technology Committee, AISTech, Columbus, OH, USA.
- **Nazim, M.** (February, 2025) "The synergistic effects of Si and Mn on Peritectic Sensitivity of AHSS casting," AIST Metallurgy – Steelmaking and Casting Technical Committee meeting, Mobile, AL, USA.
- **Nazim, M.** (February, 2025) "Optical fiber instrumented mold simulator: Mold flux impact on peritectic Sensitivity of AHSS casting," AIST Continuous Casting Technology Committee meeting, Louisville, KY, USA.

PROFESSIONAL EXPERIENCE

- **Assistant Manager, Shift In-charge, CCM Operation**
- **Senior Engineer, Shift In-charge, CCM Operation**

03/2021-05/2022

12/2019-02/2021

GPH Ispat Limited (0.8 MTPY capacity based integrated steel plant), Chattogram, Bangladesh

- Investigated on mitigating metallurgical problems and defects in semi-finished product (MS billets) and aiming for high quality product development.
- Worked on maintaining highest productivity of products with superior quality to achieve the set targets according to the production plan.
- Formulated and analyzed production report, breakdown report to take managerial decisions to ensure higher quantitative productivity.
- Supervised the innovative and state-of-the-art process of online feeding of semi-finished product (MS billets) into the rolling mill.
- Led and supervised a technical team of 15 people.

- **Senior Engineer, Mechanical Department**

02/2018-11/2019

GPH Ispat Limited (0.8 MTPY capacity based integrated steel plant), Chattogram, Bangladesh

- Planned, scheduled, coordinated, managed and executed equipment erection followed by cold and hot commissioning of world's one of the fastest Billet Casters supplied by Primetals Technology- (Austria/Germany).
- Provided technical supervision of fabrication works of more than 4000 metric tons of steels including mechanical drawing interpretation & modification as well as instruction of different steel welding techniques.

- **Analyst, Plant Operation**

11/2017-02/2018

BSRM Steel Mills, Chattogram, Bangladesh

- Facilitated technical support to the top management in decision making of plant operation based on daily production through analyzing the generated data.

TECHNICAL SKILLS

- Programming languages: MATLAB, LABVIEW, Python, RStudio
- Computer aided design/engineering: Fusion 360
- Technical expertise in advanced equipment: Scanning Electron Microscopy (SEM), Confocal Laser Scanning Microscopy (CLSM), Differential Scanning Calorimetry (DSC).

LANGUAGES

- Bengali: Native Language
- English: Fluent
- German: Conversational

EXTRA CURRICULAR ACTIVITIES

- **Voluntary Contributions:**
 - Former participant in the “Be Buddy” program. The program is initiated by the International Office of RWTH Aachen University to help in settling down newly arrived international students. Details: <https://www.rwth-aachen.de/go/id/bpei/lidx/1>
 - Current President, ICRM executive committee, ICRM (a non-profit organization), Rolla, MO, USA.

REFERENCES

- Available upon request.