Steven C. Calebrese

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Self-Starter. Creator. Engineer.

Skilled at critical and analytical thinking, especially as applied to creating, implementing, and interpreting the results of experiments. Excels at offering creative solutions in team environments. Approachable, clear, and personable communicator with a record of adapting quickly in dynamic environments. Adept at making quick, data-driven decisions that lead teams to success.

EMPLOYMENT AND TECHNICAL EXPERIENCE

Metallic Materials Lead Engineer
GE Aviation | February 2022 - Present

Defined and substantiated material and process selections on new designs and changes in current design.

Facilitated problem solving through proactive outreach to engineering teams and vendors - often taking the lead in developing and timelining a plan of action.

Provided guidance to multidisciplinary teams through material evaluations and application of technical specification and requirements.

Physics and Engineering Teacher
Hoosick Falls High School | 2015 - Present

Emphasized importance of analytical thinking, especially as applied to creating experiments, collecting data, and using results to draw conclusions consistent with data and known theories.

Implemented accurate recordkeeping, effectively managed students, timelines, budget, and supplies. Through collaboration, offered creative ideas enhancing other teachers' classrooms. Increased passing rate of Physics Regents examination to 100%.

Proposed and established AP Physics, Intro to Engineering, and Intro to Coding courses. Curriculum and timeline written to match NYS and AP standards. Budgeted and ordered new laboratory and classroom supplies to help support curriculum. Attended seminars and professional development opportunities to foster relationships and keep up with new content related, technological, and pedagogical ideas and techniques.

Topics taught included: materials characterization, crystal structures, phase diagrams, TTT diagrams, stress-strain curves, engineering statics, kinematics, electromagnetism, waves, introduction to Java and Python, and CAD. Students performed tensile tests, bend tests, 3d printing, and design and production of engineering-related projects.

Materials Engineer
WisEngineering, Benet Laboratories | March 2014 - May 2014

Supported design, production, and sustainment of large-caliber weapons systems. Innovated on materials analysis procedures. Reviewed new processes and materials in design and production of weapons systems.

Designed processes to recreate operating and environmental conditions of failed mortar tube coatings. Leveraged SEM capabilities to enhance team's ability to perform characterization of mortar tubes that catastrophically failed in the field.

Worked on three teams simultaneously in conjunction with other duties: failure of oil well pressure-relief system, characterization of alloy that underwent a new heat treatment process, failure of mortar tube cutting tool tooth.

Failure Analysis Consultant
Dr. David Duquette | 2009 - 2013

Worked as part of a two-man team to design and implement procedures for preparing and analyzing samples using failure analysis practices including cutting, mounting, polishing, and metallographic analysis via optical and electron microscopes. Proposed mechanisms of failure based on materials expertise.

Graduate Research Assistant
Materials Department, RPI in conjunction with Sandia National Laboratories | 2009 - 2013

Developed and designed processes to investigate dissolution kinetics of piezoelectric PZT in aqueous sulfuric acid solutions as a proxy for caustic environments found in oil wells.

Performed thorough literature review and collaborated with professors and other graduate students to present and receive feedback on design and analysis of research.

Created PZT samples using sol-gel spin coating process. Analyzed samples using X-ray photoelectron spectroscopy, X-ray diffraction, and Auger electron spectroscopy techniques. Proposed mechanism and rate equations for dissolution of PZT in aqueous sulfuric acid as Master's thesis.

Undergraduate Research Assistant
Materials Department, RPI

Combined the phase field model with a finite volume partial differential equations solver to conduct computational modeling of the growth of a solid from a binary solution. Investigated and analyzed the effects of temperature, solution and substrate composition, and impurities on particle growth.

Graduate Teaching Assistant - Corrosion, CAD
Materials and Mechanical Engineering Department, RPI

Taught corrosion course when professor unavailable. Covered: mechanisms, characteristics, and types of corrosion; methods for testing, comparing, and evaluating corrosion; and the suitability of metals, ceramics, and organic materials for corrosive environments.

Taught CAD course and managed two undergraduate TAs. Covered: Three dimensional modeling of parts and assemblies (SolidWorks), visualization, and isometric free-hand sketching, and computer-generated design documentation.

Held office hours, graded and gave feedback on all work. Kept accurate records of attendance and grades.

SKILLS

Leadership/Project Management
Problem Solving, Time Management, Goal Setting, Conflict Resolution, Clear and Concise Instruction, Relationship Building, Decision Making, Communication, Constructive Feedback, Delegating, Adapting, Motivating, Negotiating

Fabrication/Preparation
Sol-gel Process, Spin Coating, Polishing, Electron Beam Physical Vapor Deposition, Sputter Coating

Analytical
Metallography, Scanning Electron Microscopy, X-ray Diffraction, Auger Electron Spectroscopy, X-ray Photoelectron Spectroscopy, Cyclic Voltammetry, Tensile Testing, Bend Testing, Fracture Toughness, Failure Analysis, Electrochemistry, Data Interpretation, Test Design

Applications and Languages

HTML, CSS, Java, JavaScript, SQL, OOPS, Node.JS, React, Engineering Equation Solver, Maple, Matlab, Minitab, OpenDX, FiPy, SolidWorks, NX7, OnShape, PHI Multipak, Labview, C, Python, Java, Microsoft Office Suite (Word, Excel, Publisher, PowerPoint), Google Suite (Documents, Sheets, Slides, Forms), Smart Board

EDUCATION

Master of Science (MS) in Materials Engineering, Rensselaer Polytechnic Institute (RPI), Troy, NY
Thesis: *Dissolution of Lead Zirconate Titanate (PZT) in Aqueous Sulfuric Acid Environments*
Master of Arts in Teaching (MAT) *Physics,* Union Graduate College, Schenectady, NY
Bachelor of Science (BS) Materials Engineering, Rensselaer Polytechnic Institute (RPI), Troy, NY

OTHER EXPERIENCE

Private Tutor
Wyzant.com Independent Contractor and Sole Proprietor

Started sole-proprietorship and grew business to include six contracted tutors. Managed website and advertising, reached out to local schools and libraries, performed all client relations and acquisitions.

Property Management
Historic Ardsley and Self-Employed

Actively communicate with residents to ensure quality of residence. Advertise vacancies and interface with prospective residents. Manage maintenance and schedule with vendors for routine upkeep and repairs.

Ultimate Frisbee Tournament Director
Self-Employed

Through outreach, grew tournament from 8 teams to 32 teams (over 600 participants) in two years. Managed team of eight to prepare for and run tournament to ensure smooth and punctual tournament experience.

SELECTED COURSEWORK

Advanced Mechanical Properties of Materials
- Mechanistic and micro-structural aspects of mechanical properties of metals, ceramics, and polymers
- Phenomenological aspects of three-dimensional stress and strain, various yield criteria, elastic behavior, viscoelastic behavior, plastic behavior, statistical aspects of brittle fracture and fracture mechanics
- Micro-structural topics of edge and screw dislocations, slip systems, critical resolved shear stress, dislocation multiplication and interactions, and barriers to motion

Advanced Electronic Properties of Materials
- Exact models and approximate methods of quantum mechanics and application to behavior of electrons in solids
- Electronic energy bands in metals, semiconductors, and insulators, charge carrier statistics and transport, and Maxwell's equations
- Dielectric, optical and magnetic properties

Advanced Thermodynamics of Material Systems
- Application of classical and statistical techniques to determine phase and chemical equilibrium in real systems

Advanced Kinetics of Materials Reactions
- Topics in diffusion and phase transformation including: solutions to the diffusion equation, moving boundaries, concentration-dependence, interdiffusion, nucleation and growth from vapor and solution, precipitation, allotropic and martensitic transformations, and sintering

Materials and Energy
- Topics in understanding the various forms of energy and energy conversion

- Material's role in harnessing, producing, transducing, storing, and maximizing efficiency of energy use

Materials Synthesis and Processing

- Aspects of melt and extractive metallurgy, synthesis of polymers, ceramics, and glass, and composite materials
- Materials processing including casting and molding, deformation processing, powder processing, joining and additive processes, cutting and removal processes, and annealing/heat treatment process