

University of Maine Job Description

TITLE: Chief Engineer - Advanced Manufacturing
CLASSIFICATION: Engineer VII
DEPARTMENT: Advanced Structures and Composites Center
DATE: June 2024
REPORTS TO: Executive Director

Introduction to the Advanced Structures and Composites Center



*Figure SEQ Figure * ARABIC 2 Factory of the Future 1.0 dedicated in April 2024, includes two large printers and five end-effectors capable of up to 500lbs/hr deposition rate, continuous tape layup, 5 axis machining, and robotic arm manipulation. The larger printer has a build volume of 96ft long x 32 ft wide x 18 ft high and the smaller one 60ft long x 22ft wide x 10 ft high. They are connected to a HPC and a suite of sensors.*

The Advanced Structures and Composites Center (ASCC) is a world-leading, interdisciplinary center for research, education, encompassing material science, advanced manufacturing and engineering of composites and structures. Housed in a 100,000ft² ISO-17025 accredited facility, the ASCC has been recognized nationally and internationally for cutting edge research programs leading including industry 4.0 large-scale, large-volume agile, additive and hybrid manufacturing, innovative defense-related applications, offshore wind and marine energy, civil infrastructure, and development of bio-based materials. The ASCC is the largest university-based research Center in Maine with more than 400 full and part-time personnel, including faculty, staff, and students. Since its founding in 1996 with support from the National Science Foundation, the Center has financially sponsored more than 2,700 student interns, received over 26,000 visitors, created multiple spinoff companies through licensing of patents and trade secrets, and received more than 40 national and global awards for research excellence. The ASCC's 2020 Strategic Plan, called GEM, provides a strong focus on Green Energy and Materials development, including bio-based and recyclable feedstocks for large AM. Through GEM, the Center is at the forefront of major new AM and sustainability industries in the U.S. such as:

- **The Factory of the Future (FoF)** takes the next step in large-scale, large-volume industry 4.0 smart manufacturing, including flexible additive and hybrid manufacturing, with the goal to produce large, integrated born-certified systems in a closed-loop digital manufacturing environment powered by High-Performance Computing and AI. It is a 48,000 ft², \$81.5 million addition to the current lab slated for construction starting August 2024, which will increase the lab to 150,000ft².

- **Large-scale additive manufacturing programs** in collaboration with the DoD, DOE, Oak Ridge National Labs, and industry to develop new high-performance as well as bio-based materials that will be conducive to 3D printing large-scale structures such as boat hulls, buildings, housing, transportation, marine and energy applications.
- Leading a **Transportation Infrastructure Durability Center** including 5 New England universities to develop more sustainable, transformative, and economical solutions to address our nation's infrastructure challenges, including investigating the use of AM in transportation applications.
- **Floating offshore wind technology** developed at the ASCC led to national and international collaborations, including investments from the US DOE Wind Technology Office, ARPA-e, and many industrial partners. Plans are to deploy a 1:4 scale prototype in the Gulf of Maine in 2024, a MW-scale prototype in 2026, and a 144 MW floating wind research array later this decade. The work led to the state of Maine passing a law to acquire 3 GW of floating wind by 2040. This wind energy research includes DOE-funded projects in **Additive Manufacturing of wind blades and wind blade tooling**.

Purpose: The purpose of the Chief Engineer, Advanced Manufacturing position is to drive innovation in large-scale, large-volume advanced manufacturing with focus on digital additive, subtractive and hybrid manufacturing processes, enabling production of large integrated systems rather than just structures. The position will drive innovation within the new Factory of the Future (FoF), slated for groundbreaking in August 2024. The FoF takes the next step in large-scale smart manufacturing, with the goal to produce large, integrated born-certified systems in a closed-loop digital manufacturing environment powered by High-Performance Computing, sensors, and AI.

This position plays a pivotal role in overseeing and growing our smart manufacturing research, fostering a culture of continuous improvement, and leading cross-functional teams to deliver cutting-edge solutions that advance our organization's competitiveness in the rapidly evolving smart manufacturing landscape. The Chief Engineer position is dedicated to innovation, achieving research excellence, enhancing product and machine-hardware development, and maintaining our commitment to sustainability while fostering a collaborative and forward-thinking environment among the manufacturing research team.

Essential Duties & Responsibilities:

Technical Duties

- Lead the development of a research strategy, roadmap and portfolio in smart manufacturing that expand the capabilities and mission of the Factory of the Future (FoF).
- Lead new major proposal development efforts.
- Lead the expansion of our IP portfolio for novel smart manufacturing technologies.
- Significantly increase refereed publications and professional outreach bringing increased international recognition and reputation of the advanced manufacturing team.
- Serve of the ASCC Executive Management Team, in charge of charting the Center's future.
- Technology:
 - Lead development and deployment of new manufacturing hardware to be integrated with software libraries, sensor and computational technologies, AI frameworks, high-performance computing tools, to enable new applications in large-scale smart manufacturing.
 - Lead the development of custom advanced manufacturing solutions for housing, boatbuilding, and DoD applications.
 - Lead the development of Technical Data Packages related to the design and acquisition of specialized manufacturing equipment.

- Oversee the writing and development of technical reports and lead progress updates to sponsors and stakeholders.

Leadership and Teamwork

- Develop major research opportunities, research vision and direction.
- Organize teams to capture major multi-million-dollar funding opportunities.
- Effectively supervise and grow a world-leading motivated advanced manufacturing team.
- Develop collaborations within ASCC, as well as with university faculty, students, and external partners.

Education and Training

- Enable advanced educational and training opportunities for faculty, staff, and students.
- Lead development of new educational programs in smart manufacturing including new coursework, undergraduate concentrations, and graduate programs, in collaboration with the Maine College of Engineering and Computing (MCEC).
- Create and lead conferences webinars, trainings, etc.
- Lead national technical committees or professional organizations.

Knowledge & Skill Qualifications:

Required:

- Ph.D. in engineering relevant to advanced manufacturing or a related science, or M.S. with equivalent industry experience in smart manufacturing.
- 15 plus years of professional experience in advanced manufacturing and technology development required.
- Expertise in one or more of: Advanced/smart manufacturing technologies, industry 4.0, Additive Manufacturing, Automated Tape/Fiber Layup, machining, composite materials and polymers, robotics, modeling and simulation of engineering processes, equipment design, and engineering design.
- Excellent oral and written communications skills.
- Effectiveness working in a research environment that bridges between discovery and applications.
- Demonstrated experience in managing a research group and leading a research portfolio.
- Demonstrated ability to handle multiple projects and constant deadlines.

Position Type: Contingent on funding and successful performance.

Work Schedule: Normal University of Maine business hours are Monday through Friday 8:00 a.m. to 4:30 p.m. Due to the nature of the position, work beyond regular hours (to include evenings and weekends) will be necessary to meet the requirements of the position. The employee shall establish regular office hours and in consultation with the supervisor, adjust the work schedule as appropriate. **This position is considered Essential Personnel in the ASCC Storm Day Policy.**

Work Environment: Work will be performed at the Advanced Structures and Composites Center 100,000 ft² laboratory being expanded to 148,000ft² with a world-leading team of over 400 faculty, staff, and students.

Schedule for Evaluation: In the initial six months of employment and annually thereafter in accordance with the UMPSA agreement.

Job Family/Salary Band: 07/10.

Appropriate background checks will be required. The finalist for this position must successfully complete a pre-employment physical.

All UMS employees are required to comply with applicable policies and procedures, as well as to complete applicable workplace related screenings, and required employee trainings, such as Information Security, Safety Training, Workplace Violence and Sexual Harassment.