**University of Maine**

**Job Description**

**TITLE:** Engineers, Technical Leads, Project Managers and Program Managers (Engineer IV – VII)

**DEPARTMENT:** Advanced Structures & Composites Center

**DATE:** July 2021

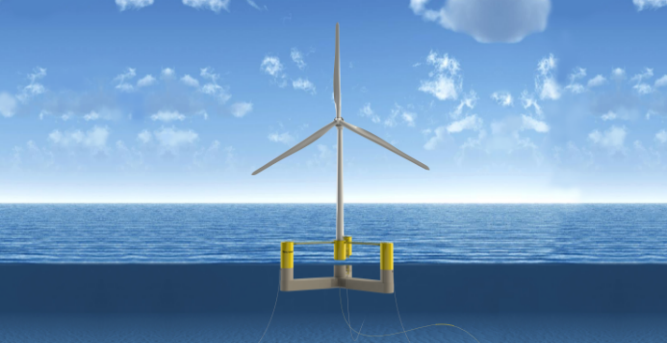
**REPORTS TO:**  Executive Director, Chief Operating Officer, Senior Program Managers

**Build the Industries of Tomorrow at the World-Leading Advanced Structures and Composites Center**

The Advanced Structures and Composites Center (ASCC) is a world-leading, interdisciplinary center for research, education, and economic development encompassing material sciences, 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 and impacting new industries including offshore wind and marine energy, civil infrastructure, bio-based large-scale 3D printing, soldier protection systems and innovative defense-related applications. The ASCC is the largest university-based research Center in Maine, and one of the fastest growing research laboratories in the world, with research revenue growth of 5X in the past 5 years. Facility has expanded to include 13 integrated laboratories with more than 260 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 2,600 students, received 70 patents, received over 26,000 visitors**,** created 14 spinoff companies through licensing of patents or trade secrets, and received more than 40 national and global awards for research excellence.

3Dirigo, a 25 ft. long, 5,000lbs patrol boat printed by UMaine in 72 hours, winning a Guinness World Record.

The ASCC’s Strategic Plan, called GEM (Green Energy & Materials), focuses the Center’s work on Green Energy and Materials development. Through GEM, the Center is at the forefront of major new sustainability industries in the U.S., including these recent successful initiatives:



ASCC secured $150 million commitment to build a 10-12MW floating turbine using its patented VolturnUS technology.

* Floating offshore wind technology developed at the ASCC led to a $100 million investment by global energy heavyweights Diamond Offshore Wind and RWE Renewables, and $50 million investment from the US DOE, to launch the first full-scale floating offshore wind project off the Maine coast. [Read more about this accomplishment](https://www.rechargenews.com/wind/global-energy-heavyweights-buy-into-us-flagship-floating-wind-power-pilot/2-1-853183?fbclid=IwAR1BBecQnACb1d0plfn03lIGeuMWPHTblxKW8I8N3e2peSHmZxhppDK9V5o)
* Awarded three Guinness World Records for the world’s largest prototype polymer 3D printer, largest solid 3D-printed object, and largest 3D-printed boat. The awards came after ASCC printed 3Dirigo, a 25ft marine patrol vessel weighing 5,000lbs in under 3 days. [Read more about this accomplishment](https://umaine.edu/news/blog/2019/10/10/umaine-composites-center-receives-three-guinness-world-records-related-to-largest-3d-printer/)
* First large-scale bio-based additive manufacturing program in the US, via a $20M additive manufacturing program with Oak Ridge National Lab to work with the forest products industry to produce new bio-based materials that will be conducive to 3D printing large-scale products such as boat hull molds, shelters, building components, tooling for composites and wind blades. [Read more about this accomplishment](https://oakridgetoday.com/2019/05/01/ornl-university-of-maine-to-announce-20-million-3d-printing-manufacturing-partnership/)



Largest polymer 3D printer in the world, commissioned at ASCC in Q4 2019. The print volume is 60 ft x 22ft x 10ft, and deposition rate is 150 lbs/hour

* Selected to lead the $14.2 million Transportation Infrastructure Durability Center with 5 other universities across New England to develop more sustainable, transformative and economical solutions to address our nation’s infrastructure challenges. [Read more about this accomplishment](https://composites.umaine.edu/2018/06/13/umaine-wins-14-2m-u-s-dot-award-form-transportation-infrastructure-durability-center/#:~:text=UMaine%20Wins%20%2414.2M%20DOT,Composites%20Center%20%2D%20University%20of%20Maine)

**Purpose:** The purpose of these positions is to manage and lead research for Advanced Structures and Composites Center R&D programs; manage operations for growth, budget and resource planning; create, develop and plan new programs; direct, manage and oversee all engineering for multiple research programs and identify partners in the composites industry and to develop proposals for federal, state, and industry-funded R&D and demonstration programs in cooperation with industry partners.

**Hiring Expectations:** Below are a list of research areas. We are hiring experienced Engineers, Technical Leads, Project Managers and Program Managers, depending on experience and qualification. Within each research area, applicants may be assigned to the functional area as a whole (e.g. Thermomechanical Modeling) or a specific research project or program within that area (specific DOD-funded program). In your cover letter, please specify which of the below research area/s you are applying for and whether you prefer Technical or Management Track positions. Applicants are welcome to apply to multiple positions and Tracks.

**Additive Manufacturing:**

We seek to hire highly-qualified Engineers, Managers and Technical Leads to support our continued growth in the area of large scale thermoplastic additive manufacturing. We seek both Management Track positions and Technical Track positions. The purpose of these positions is to lead research efforts to innovative new additive manufacturing technology and process and execute a wide variety of projects for both federal and private customers. These positions will include integration of new processes, sensors and control systems into the world’s largest thermoplastic 3D printer. These positions will lead the implementation of equipment upgrades in collaboration with research engineers and external suppliers. This work will support, plan, and conduct assigned and/or original research in a variety of research and development projects encompassing material sciences, manufacturing, and the engineering of composites and structures while working collaboratively with faculty, staff, and graduate and undergraduate students at the Advanced Structures and Composites Center.

* (Management Track-only requirement) Substantial experience with delivery of complex additive manufacturing or advanced manufacturing projects, including team leadership, operations management, systems development and improvement
  + - Coordinate resources across multiple research programs to meet technical objectives
    - Ensure Programs acquire the human, financial and physical resources they need to succeed; include short-term and long-term strategic planning
    - Develop process improvements and resolve competing priorities for printing resources
    - Help establish matrix structure for research operation that includes both functional and program reporting needs
    - Improve manufacturing systems through setting up KPIs, improving cost-efficiency, equipment purchasing, systems integration, safety, etc.
* Significant experience in some of the following areas: advanced composites, finite element modeling and analysis, engineering design, and advanced mechanics of materials
* Preferred three to seven or more years’ experience in thermoplastic process equipment or CNC equipment development and upgrades
* Knowledge of equipment driven using Siemens controllers
* Working proficiency in PLC programming and development
* Working proficiency in CAD modeling (surface and or solid) experience
* Experience in carrying out static and dynamic laboratory load tests of composites
* Finite element analysis (FEA) experience
* Additive Manufacturing, compounding, and/or extrusion experience
* 5 Axis CNC tool pathing experience (preferably with MasterCam)

**Composites Materials Design:**

We seek to hire highly-qualified Engineers, Managers and Technical Leads, to support our continued growth in the area of structural thermoplastics and 3D printing for a range of structural applications. The purpose of these positions is to provide project management and technical leadership for evaluating, designing, and improving large scale structural thermoplastics composites and additive manufacturing for DoD applications. These positions will support, plan, and conduct assigned and/or original research in a variety of research and development projects encompassing material sciences, manufacturing, and the engineering of composites and structures while working collaboratively with faculty, staff, and graduate and undergraduate students at the Advanced Structures and Composites Center.

* Significant experience in some of the following areas: advanced composites, thermoplastic composites design and manufacturing, FEA, design for additive manufacturing (3D printing), systems and assembly, advanced mechanics of materials
* Experience in some of the following areas: advanced composites, finite element modeling, engineering design, advanced mechanics of materials (typically three - five years), additive manufacturing
* Significant experience in the analysis and design of structural composites required
* Significant experience interacting with composite industry vendors, suppliers, industry trade associations and government sponsors of research

**Wind Blade Design & Manufacturing:**

We seek to hire highly qualified Engineers and Managers to support a new research program to accelerate wind blade development through rapid, low-cost fabrication of large modular wind blade tooling. This includes the development of specifications for additive-manufactured blade tooling, participating in scale-up of technology, developing and validating new segments and demonstrate fabrication methods.

* Strong project and program management experience, including leading teams to successful project executions and managing scope, schedule, budget and quality constraints
* Experience reviewing drawings to verify manufacturability and integrating design and manufacturing processes
* Knowledge of existing wind blade manufacturing processes
* Experience developing prototypes and scaling up to meet volume production requirements
* Demonstrated competence in mechanical engineering design and drawing of 3-D assemblies
* Proficiency in design and analysis with Solidworks, Excel, MATLAB, and Abaqus or ANSYS
* Excellent written communication skills, as demonstrated in specifications, presented calculations and technical reports
* Experience in design, fabrication or testing with plastics and composites
* Experience with automated data acquisition or test control systems

**Thermomechanical Modeling:**

We seek to hire highly-qualified Engineers and Technical Leads to support our continued growth in the area of structural thermoplastics and 3D printing for a range of structural applications. The purpose of these positions is to provide computational modeling expertise and capacity for determining the thermo-mechanical behavior of Large Area Additive Manufacturing (LAAM) system based on thermoplastics. These positions will support and conduct assigned and/or original research in a variety of research and development projects encompassing material sciences, manufacturing, and the engineering of composites and structures while working collaboratively with faculty, staff, and graduate and undergraduate students at the Advanced Structures and Composites Center.

* Demonstrated simulation skills in finite element analysis, structural optimization analysis, nonlinear and linear analysis, familiar with computer aided engineering software (ANSYS, Abaqus, GOMA, Sierra, Catia or similar programs)
* Preferred experience in building thermo-mechanical models of 3D prints
* Experience with writing code, subroutines for another program

**Robotic Systems Integration and Facility Design:**

We seek to hire highly qualified Engineers, Managers and Technical Leads to support design of advanced manufacturing systems and facilities. These include large format, synchronous, AI-enabled arrays of additive (3D printing), subtractive (CNC machining), and hybrid robotic systems, powered by sensors and high performance computers (HPC).

* Strong project and program management experience, including leading teams to successful project executions and managing scope, schedule, budget and quality constraints
* Experience with manufacturing projects designed and executed for large-scale, industrial manufacturing facilities with highly complex, robotic systems, including:
  + Specification of positioning systems such as robots, gantries, overhead rail and mobile floor systems to meet motion, payload and accuracy requirements
  + Control of static and mobile positioning systems
  + Application of sensors to robotic systems to enable monitoring, feedback, control and real time automated decision making
  + Integration of multiple systems for close coordination of concurrent additive and subtractive operations
  + Integration of multiple systems for consecutive additive and subtractive operations
  + Familiarity with large scale positioning system with reach and operating envelopes operating over 10's and 100's of feet
  + Integration of robotic systems with high performance computing resources for large data collection and real time computation
  + Integration of drone technology with a robotics manufacturing environment for quality control purposes
* Experience with supplier and vendors across the supply chain for down selection, acquisition and commissioning of complex systems
* Experience with various construction project delivery methods (Design-Bid-Build, Engineer-Procure-Construct, Construction Manager-at-Risk, etc.)

**General Scope of Duties:**

* + Performs managerial responsibility in keeping research program on schedule and meeting technical and business objectives
  + Designs, manages and supervises engineering analysis, design and testing aspects for multiple projects
  + Designs and approves tests to be conducted to fit the client’s needs
  + Manages manufacturing process development
  + Develops, writes and approves work instructions and executes drafts as required
  + Provides weekly, quarterly and monthly progress reports to clients and sponsors
  + Writes industrial contract proposals and proposals for grants and other contracts
  + Writes patent applications
  + Writes and approves interim and final reports to clients and sponsors
  + Conducts presentations of research and testing results and writes technical reports and papers for journals, periodicals, conferences, clients, sponsors and team members
  + Develops project plans and maintains updated Gantt charts for projects
  + Coordinates teams and assigns tasks for completing research program plans
  + Manages Advanced Structures and Composites Center program resources for growth and expansion
  + Attracts grant work by actively contacting potential clients and drafting written proposals to meet their needs
  + Represents Advanced Structures and Composites Center at national technical meetings and trade shows
  + Position responsibilities and decisions towards final results impact the direct success of more than one project or task in a program
  + Errors in decision making are not typically apparent and could result in significant risk to research funding or create a serious safety issue/concern
  + Communicates with vendors to establish purchase specifications for research and testing materials, non-capital equipment and capital equipment
  + Engages clientele in commercialization of Advanced Structures and Composites center developed technologies
  + Involves Advanced Structures and Composites Center personnel/faculty as necessary in proposal writing process to obtain funding
  + Establishes collaborative relationships with prospective clients and sponsors
  + Conducts conference calls, visits and meetings with clients and sponsors
  + Requires a high level of contact with other university departments to address issues affecting the strategic objectives of the university and Advanced Structures and Composites Center
  + Position responsibilities can have a major positive or negative impact on public relations or the university’s image. Issues or problems resulting with potential or current clients or industry partners would require the attention of university administrative staff and would typically require formal actions or decisions that could affect the reputation of the university
  + Participates in determination of project staffing requirements, conducts interviews, leads search committee, and facilitates hiring process
  + Supervises and guides project staff including professional and classified staff as well as graduate and undergraduate students
  + Provides safety and environmental management supervision and advice for graduate and undergraduate students
* Analyzes program budgets, approves expenditures, and makes recommendations based on evaluation of fiscal status on accounts totaling up to or exceeding $1.8M
* Administers project budgets, plans and forecasts future expenditures, and approves transactions on accounts totaling up to or exceeding $1.3M
* Approves purchase of non-capital and minor capital equipment, materials and supplies for use in research projects
* Performs other reasonably related duties as assigned

**Qualifications**

* + Minimum of M.S. in Engineering or Science required or an equivalent combination of education and experience in technical roles. *It is anticipated that those pursuing a Technical Track would have higher levels of education attainment (PhD preferred) and research experience, while those pursuing Management Track position would have higher level of experience leading teams and projects to successful execution.*
  + This position requires more than seven years of relevant professional experience
  + Substantial experience in R&D project management and personnel management
  + Demonstrated outstanding oral and written communication skills essential
  + Demonstrated ability to handle multiple projects and constant deadlines
  + Demonstrated ability to interact with industry members
  + Demonstrated successful experience in program development
  + Experience in directing student research desired

The University offers:

* Competitive compensation packages and benefits package
* Opportunities for funded enrollment in academic classes

For further details about the Advanced Structures and Composites Center, please visit:

<https://composites.umaine.edu>

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.