The Department of Mechanical Science and Engineering at The Grainger College of Engineering seeks applicants for a Visiting Research Engineer.

The University of Illinois is an Equal Opportunity, Affirmative Action employer that recruits and hires qualified candidates without regard to race, color, religion, sex, sexual orientation, gender identity, age, national origin, disability or veteran status. For more information, visit http://go.illinois.edu/EEO.

The Visiting Research Engineer will plan and conduct experiments involving different chemicals and solutions, utilize principles of fluid mechanics, mass transfer and heat transfer to accomplish separations, and perform computations of flow and mass transfer.

Specific duties and responsibilities include:

**Separation of solutions**

- Separation of ethanol from its aqueous liquid solutions.
- Plan and conduct experiments involving the use of ultrasound to separate ethanol from its aqueous liquid solutions.
- Plan and conduct experiments involving the use of ultrasound to separate alkanols and other low-molecular weight solutes from multicomponent aqueous liquid solutions.
- Design continuous-flow processes and apparatus for ultrasound-driven separation of ethanol from its aqueous solutions, and of alkanols and other low-molecular weight solutes from multicomponent aqueous liquid solutions.

**Mass Transfer Computations**

- Convective mass transfer computations relevant to fresh-cut produce safety.
- Complete draft of manuscript reporting high Schmidt number computations of "wash-out" of organic exudate.
- Complete spectral-element computation of reaction of hypochlorite ion with gluconic acid.
- Draft manuscript reporting spectral-element computation of reaction of hypochlorite ion with gluconic acid.
- Modify existing plots for use in paper describing how previous results (Min, Fischer & Pearlstein, *Int. J. Heat Mass Transfer*, 159, 119740, 2020) can be used to inform design of industrial produce-washing processes.

- Other duties as assigned.

**Minimum Qualifications:**

**Education**

Required: Ph.D. in mechanical engineering or chemical engineering.

**Experience**

Required: Experience in using ultrasound to separate low-molecular weight solutes from aqueous binary and multicomponent aqueous solutions. Experience in designing and modifying experimental systems involving continuous flow of non-isothermal binary and multicomponent liquids, and aerosols.
resulting from atomization of such liquids into a carrier gas. •Experience in using spectral-element techniques for fully-resolved computational solution of convective mass transfer problems at high Schmidt numbers relevant to liquids. •Experience in computation of binary and multicomponent liquids in which the viscosity is a significant function of composition. •Experience with use of automated meshing techniques for two- and three-dimensional computational domains •Experience in drafting scientific papers for publication •Experience in preparing and presenting oral presentations for diverse technical audiences •Experience with laboratory electronics, including selection of wiring and power supplies

Knowledge, Skills and Abilities:
Knowledge of heat transfer
Knowledge of mass transfer in liquid and liquid/gas flows of binary and multicomponent systems
Knowledge of fluid mechanics in liquid and liquid/gas flows of binary and multicomponent systems
Knowledge of laboratory electronics
Experimental background and experience in using ultrasound to separate low molecular weight solutes from aqueous binary and multicomponent aqueous solutions.
Ability to design and modify experimental systems involving continuous flow of non-isothermal binary and multicomponent liquids, and aerosols resulting from atomization of such liquids into a carrier gas.
Knowledge of spectral-element techniques for fully-resolved computational solution of convective mass transfer problems at high Schmidt numbers relevant to liquids.
Experience in computation of binary and multicomponent liquids in which the viscosity is a significant function of composition.
Knowledge of meshing techniques for two- and three-dimensional computational domains.
Knowledge of written technical English sufficient to draft and revise scientific papers for publication.
Knowledge of spoken technical English sufficient to prepare and present oral presentations for diverse technical audiences.
Knowledge of laboratory safety as it pertains to electrical, chemical, and thermal hazards.
Background and experience in precision measurements of concentrations in aqueous solutions using high-performance liquid chromatography.
Use of the laboratory information system LabVIEW.
Experience in using data acquisition hardware and software.
Excellent interpersonal skills.
Independent judgment in dealing with and reporting anomalies in experiments and computations.
Ability to respond to time pressure.

The Visiting Research Engineer position is a full time, benefits-eligible Academic Professional position appointed on a 12-month service basis. This position may become permanent at a later date. The expected start date is as soon as possible after the closing date. Applicants may be interviewed before the closing date; however, no hiring decision will be made until after that date. Salary is commensurate with experience and qualifications.

To apply for this position, please create your candidate profile at http://jobs.illinois.edu and upload your cover letter, resume, and names/contact information for three references by November 1, 2021. Full consideration will be given to complete applications received by the closing date. For further information regarding application procedures, contact Hannah Dorsey, hdorsey@illinois.edu, 217-333-4978.

The University of Illinois conducts criminal background checks on all job candidates upon acceptance of a contingent offer. Convictions are not a bar to employment. The University of Illinois System requires candidates selected for hire to disclose any documented finding of sexual misconduct or sexual harassment and to authorize inquiries to current and former employers regarding findings of sexual misconduct or sexual harassment. For more information, visit Policy on Consideration of Sexual Misconduct in Prior Employment. As a qualifying federal contractor, the University of Illinois System uses E-Verify to verify employment eligibility. The University of Illinois must also comply with applicable federal export control laws and regulations and, as such, reserves the right to employ restricted party screening procedures for applicants.