Proposal for Training on Operations of Structural Dynamics Testing Facility

The University at Buffalo’s Structural Engineering and Earthquake Simulation Laboratory (SEESL) in the Department of Civil Structural and Environmental Engineering (CSEE) hosts researchers or technical staff for intensive training on operations of structural dynamics testing facility. The hands-on training includes two stages of instructions: one academic and the other practical laboratory experimentation. The training period and the depth of instruction are negotiable. The recommended instruction period is from one semester to six months. The training is done on an internship basis sponsored by the trainees’ home institutions or a qualified agency or industry (such as Equipment manufacturer, etc.) based on a mutual agreement with SEESL and University authorities.

Who should attend?

The training is planned for researchers and laboratory staff with interests in operating the equipment and or/other components in a structural dynamics facility. The participants must have basic background on structural dynamics.

The SEESL will accept individuals or small groups 2 to 3 trainees. The number of trainees will be limited to six at any one time.

Academic Instruction

The trainees will be provided with a self-study package consisting of the materials presented in University at Buffalo’s CIE 616 (the graduate course in Experimental Methods in Structural Engineering). The topics covered in this course provide a comprehensive background in experimental conduct and supporting theory as practiced at UB SEESL/NEES and in Structural Engineering laboratories worldwide. Regular advisement / instructional hours will be scheduled during which they will receive individualized instruction from CSEE faculty, graduate assistants, and SEESL/NEES professional staff. Typically, these sessions may be 2 – 3 hours per week. Topics covered will include (but may not be limited to): experiment planning, modeling and scaling, loading systems, instrumentation, data acquisition, error analysis, and data management.

Laboratory/Experimental Instruction

- **Mechanical Assembly**
  During the course of six month residency, the trainees will be expected to participate in the specimen assembly and test equipment preparation activities at the SEESL facility. Their level of participation will vary according to their backgrounds and interests. For example, the trainees will not be required to perform heavy machining or welding tasks, but may be asked to participate in the assembly of test specimens and experimental equipment when that participation is within their level of ability and/or prior experience. The laboratory safety officer must approve the trainees’ level of participation. The trainees will be expected to follow all standard safety procedures. They must provide their own safety shoes. Hardhats, safety glasses, ear protection and other safety equipment will be provided.
• **Instrumentation/Data Acquisition**
  As part of any experiment, the setup of sensors, instrumentation and data acquisition systems is extremely critical to the success of the experiment. During this phase of an experiment, the trainees will be asked to observe procedures, as well as participate in both installation and calibration of the integrated sensor/conditioner/DAQ system. The trainees will be instructed by UB-SEESL/NEES instrumentation technicians before being assigned any duties.

• **MTS Controller Functions and Test Operations**
  Since one of the goals of this training is to provide the trainees with a background in the operation of shaking tables and other MTS equipment, UB-NEES MTS equipment operators will spend several hours per week training the trainees in the UB-SEESL/NEES equipment operational procedures. A portion of the training will be provided during the conduct of actual experiments, during which the trainees are expected to observe the actions of the test operators, take notes, and ask questions as necessary. During non-critical operations, the trainees may be provided with hands-on training in the operation of the MTS GUI-based controllers (for both the shaking tables and the structural actuators).

• **MTS STEX Software Operation and Management**
  If an MTS seismic simulator is part of the installation at the trainees’ home institution, it is assumed that the installation includes the MTS Seismic Test Executive (STEX) software application, or equivalent. In the UB-NEES installation, STEX is used to assemble a database of ground motions and to provide offline compensation of motions in order to account for specimen/table interactions during testing in the elastic range. UB SEEESL/NEES test engineers will provide extensive STEX training during the conduct of experiments and during non-testing training sessions. If required by the nature of their home institution, trainees will be instructed on the STEX application simultaneously with junior UB-SEESL/NEES technical staff, since that instruction had already been scheduled for the upcoming year.

**Period of Instruction**

The training period and the depth of instruction are negotiable. The program listed above is best achieved in a recommended instruction period of one semester or six months. The training can be scheduled to start at anytime during the year, however, it is recommended to start either in mid August or mid January to overlap with the academic semesters.

**Office Space**

The trainees will reside in Buffalo for the period of training, during which time they will be provided desk space in the UB-NEES collaboration room (133A Ketter Hall). Computing facilities are available in the room, and the trainees will be granted UB-IT user accounts, and as needed, accounts on the UB-NEES and other department domains. If the trainees choose to provide their own portable computers, UB-NEES IT staff will provide assistance with configuration and access to networked computing facilities. Upon receipt of UB Cards, the trainees will be granted electronic door lock access to the building, the collaboration room, and the laboratory as needed.

**Insurance and Indemnification**

An insurance certificate should be provided by the sponsoring institution along with an indemnification form. See Access Rules at [http://nees.buffalo.edu/facilities/](http://nees.buffalo.edu/facilities/)  Excerpt from the Access Rules’ document is shown below.

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**“Insurance and Liabilities:**

*Employees and students of the University at Buffalo or the Research Foundation of SUNY who completed safety training are covered by the Research Foundation’s comprehensive liability insurance and/or the university’s self-insurance against injuries that may result from work in SEESL. This does not apply to NEES, or non-NEES, researchers from other institutions that perform research in the SEESL facility.*
Visiting researchers must carry a certificate of insurance from their home institution. Each visiting researcher shall provide prior to the work at SEESL a certificate of insurance before access is permitted to the facility. Such certificate shall provide evidence that the home institution carries sufficient levels of insurance and shall name the State University of New York, The Research Foundation of State University of New York, and the People of the State of New York as additional insured parties. The insurance shall cover personal injury and injury to others for which the researcher is responsible, and damage to property that is caused by the researcher.

The researchers must agree to hold UB and the UB faculty and staff of the SEESL/UB-NEES node harmless for any acts, errors, omissions, and negligence. A release form signed by either the researcher or their HOME INSTITUTION is attached to this document.

For additional details of the Access Rules see the website indicated above.

**Costs and Sources of Funds**

Training fees will be applied to include the instructions, laboratory expenses, access to computing facilities, University fees, etc. The suggested fees per person are as follows:

1) $1000 per week for at least 6 weeks training.
2) $700 per week for at least 10 weeks training.
3) $600 per week for at least 16 weeks training.

For groups of 2 to 3 trainees, training simultaneously, the fees will be reduced to 60% or 45% per person, respectively.

University overhead of 57% will apply to the above fees. The fees structure will be established in a brief contract which will specify the form and schedule of payments (see attached Invoice / Contract).

**Note for International Trainees**

International trainees will have to obtain proper Exchange Visitor Visa. The University at Buffalo will assist the trainees with the documentation through its International Students and Visitors Services.

The organizers will facilitate visits during the training period to other facilities of same type in the US. The expenses for such visits will be borne by the visitors.