



## Department of Civil, Structural, and Environmental Engineering

### **SEESL** Structural Engineering and Earthquake Simulation Laboratory **SEESL**

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### **A Comprehensive Training Program on the Operation of a Structural Dynamics Testing Facility**

The University at Buffalo NEES-Site, in conjunction with the 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 the operation of a structural dynamics testing facility. The hands-on training includes two stages of instruction: 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 base sponsored by the guests' home institutions or a qualified agency or industry (such as Equipment manufacturer, etc.) based on a mutual agreement with UB-NEES/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.

SEESL will accept individuals or small groups consisting of two to three trainees. A maximum of six trainees will be hosted at any given time.

#### **Academic Instruction**

The guests will be provided with a self-study package consisting of the material presented in the University at Buffalo's CIE 616 (a graduate level 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 and instructional hours will be scheduled, during which trainees will receive individualized instruction from CSEE faculty, graduate assistants, and SEESL/NEES professional staff. These sessions will typically be two to three hours per week. Training topics 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 the six month residency, the trainees will be expected to participate in the specimen assembly and test equipment preparation activities of the laboratory. 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 their level of participation. The trainees will be expected to follow all standard safety procedures. *Trainees 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 the 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 tasks.

- **MTS Controller Functions and Test Operations**

Since one of the primary goals of the training program is to provide individuals with a background in the operation of shaking tables and other MTS equipment, UB-NEES MTS equipment operators will spend several hours per week instructing the trainees in the operational procedures pertinent to the UB-SEESL/NEES equipment. A portion of the instruction will be provided during the conduct of actual experiments, during which the trainees will be expected to observe the responsibilities and actions of the test operators, take comprehensive notes, and ask questions as necessary. During periods of non-critical operation, the trainees may be provided with hands-on experience 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 SEESL/NEES test engineers will provide extensive STEX training during the conduct of experiments and during non-testing training sessions.



## **Period of Instruction**

The training period and the depth of instruction are negotiable. The recommended period of instruction, to achieve optimal results, is the equivalent of one semester or up to 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 a period up to six months, during which time they will be provided desk space in the UB-NEES collaboration room (133A Ketter). 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, the UB-NEES IT staff will provide assistance with configuration and access to networked computing facilities. Upon receipt of UB-ID 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 must be provided by the sponsoring institution along with a signed indemnification/release form. See Access Rules at <http://nees.buffalo.edu/facilities/>. The following is excerpted from the “SEESL/UB-NEES Access Rules and Policies” document:

### **“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, who 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 must be provided.....”*



## **Training Fees And Cost Structure**

Training fees will be applied to cover the instruction, laboratory expenses, access to computing facilities, applicable university fees, etc... The nominal fee structure, per person is as follows:

- \$1000 per week for a minimum 6-week training program
- \$700 per week for a minimum 10-week training program
- \$600 per week for a minimum 16-week training program

For groups consisting of two to three individuals, that go through the training program simultaneously, the fee structure will be reduced to 60% or 45% of the weekly rates, per person respectively.

Note: Discounted fees are available to NEES Consortium members and NEES researchers. For details, please contact the UB-NEES Site Operations Manager.

A nominal university overhead rate of ~57% will be added to the fees listed above. The applicable fee structure will be formalized in a brief contract which will also specify the terms and schedule for payments.

## **Note for International Trainees**

Prospective international trainees will be required to obtain proper "Exchange Visitor Visas". The University at Buffalo will assist the trainees with the required forms and documentation through its International Students and Visitor Services Office.

The organizers will facilitate visits to other similar facilities, within the United States, for the trainees during their period of instruction. All expenses for such visits will be borne by the trainees.

## **Contact Information**

For additional information and details please contact:

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