



# UC DAVIS

## Mechanical and Aerospace Engineering

### INJURY AND ILLNESS PREVENTION PROGRAM

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This Injury and Illness Prevention Program has been prepared by the University of California, Mechanical and Aerospace Engineering department in accordance with University Policy (UCD Policy & Procedure Manual Section 290-15: Safety Management Program) and California Code of Regulations Title 8, Section 3203 (8 CCR, Section 3203).

#### **Revision History:**

9/14/2017: Reviewed and updated by Loan-anh Nguyen

- Implemented new IIPP template

- Removed Ghausi Hall

- Added building contact information

- Updated and listed more JSA's

- Modified and added relevant safety training forms for Chemical Hygiene Plan and Hazard Communication labs

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# Department Information

Department Name: **Mechanical and Aerospace Engineering**

Department Chairperson: **Stephen K. Robinson**

Address: **2132 Bainer Hall • One Shields Avenue • Davis, CA 95616-5294**

Telephone Number: **(530) 752-0580**

## Buildings Occupied by Department

- 1. Building:** Bainer Hall and Bainer Wind Tunnel Building  
**Unit(s):** Administration, Research and Teaching  
**Contact:** Loan-anh Nguyen  
**Phone:** 530-752-8488
- 2. Building:** Kemper Hall  
**Unit(s):** Research  
**Contact:** Loan-anh Nguyen  
**Phone:** 530-752-8488
- 3. Building:** TB207  
**Unit(s):** Research  
**Contact:** Loan-Anh Nguyen  
**Phone:** 530-752-8488
- 4. Building:** Academic Surge Building  
**Unit(s):** Administration, Research and Teaching  
Advanced Highway Maintenance and Construction Technology Research Center (AHMCT)  
**Contact:** Loan-Anh Nguyen, Wil White  
**Phone:** 530-752-8488, 530-752-1455
- 5. Building:** Advanced Transportation Infrastructure Research Center (ATIRC)  
**Unit(s):** Research  
**Contact:** Wil White  
**Phone:** 530-752-1455
- 6. Building:** Advanced Materials Research Laboratory (AMRL)  
**Unit(s):** Research  
**Contact:** Loan-anh Nguyen  
**Phone:** 530-752-8488
- 7. Building:** Hangar 16A-B  
**Unit(s):** Research  
**Contact:** Loan-anh Nguyen  
**Phone:** 530-752-8488

# I. Authorities and Responsible Parties

The authority and responsibility for the implementation and maintenance of the Injury and Illness Prevention Program (IIPP) is in accordance with University Policy (UCD Policy & Procedure Manual Section 290-15: Safety Management Program) and California Code of Regulations (8 CCR, Section 3203) and is held by the following individuals:

1. Name: **Stephen K. Robinson**

Title: **Department Chairperson**

Authority: Authority and responsibility for reviewing and ensuring implementation of this IIPP

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

2. Name: **Felicia A. Smith**

Title: **Department Manager**

Authority: Department designated authority for implementation of this IIPP

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

All Principal Investigators and supervisors are responsible for the implementation and enforcement of this IIPP in their areas of responsibility in accordance with University Policy (UCD Policy & Procedure Manual Section 290-15: Safety Management Program).

## Annual Review Documentation

<u>Responsible/Designated Authority</u>	<u>Date</u>
Loan-anh Nguyen, DSC	9/14/2017
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

## II. System of Communications

1. Effective communications with **Mechanical and Aerospace Engineering** employees have been established using the following methods:

- Standard Operating Procedures Manual
- Safety Data Sheets
- Monthly departmental operations meetings
- Internal media (department safety information is found on the department main website)
- EH&S Safety Nets
- Training videos
- Safety Newsletter
- Handouts
- Building Evacuation Plan
- E-mail
- Posters and warning labels
- Job Safety Analysis (as part of this department IIPP document)
- Other (list): \_\_\_\_\_

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MAE Annual Safety Training is provided initially to newcomers to the department and as a refresher training for all others.

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A safety bulletin is located in the main hallway near the administrative offices.

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2. Employees are encouraged to report any potential health and safety hazard that may exist in the workplace. **Hazard Alert/Correction Forms** ([Appendix A](#)) are available to employees for this purpose. Forms are to be placed in the Safety Coordinator's departmental mail box. Employees have the option to remain anonymous when making a report.
3. Employees have been advised of adherence to safe work practices and the proper use of required personal protective equipment. Conformance will be reinforced by discipline for non-compliance in accordance with University policy ([UC Davis Personnel Policies for Staff Members- Section 62, Corrective Action](#)).

### **III. System for Assuring Employee Compliance with Safe Work Practices**

Employees have been advised of adherence to safe work practices and the proper use of required personal protective equipment. Conformance will be reinforced by discipline for non-compliance in accordance with University policy ([UC Davis Personnel Policies for Staff Members- Section 62, Corrective Action](#)).

The following methods are used to reinforce conformance with this program:

1. Distribution of Policies
2. Training Programs
3. Safety Performance Evaluations

Performance evaluations at all levels must include an assessment of the individual's commitment to and performance of the accident prevention requirements of his/her position. The following are examples of factors considered when evaluating an employee's safety performance.

- Adherence to defined safety practices.
  - Use of provided safety equipment.
  - Reporting unsafe acts, conditions, and equipment.
  - Offering suggestions for solutions to safety problems.
  - Planning work to include checking safety of equipment and procedures before starting.
  - Early reporting of illness or injury that may arise as a result of the job.
  - Providing support to safety programs.
4. Statement of non-compliance will be placed in performance evaluations if employee neglects to follow proper safety procedures, and documented records are on file that clearly indicate training was provided for the specific topic, and that the employee understood the training and potential hazards.
  5. Corrective action for non-compliance will take place when documentation exists that proper training was provided, the employee understood the training, and the employee knowingly neglected to follow proper safety procedures. Corrective action includes, but is not limited to, the following: Letter of Warning, Suspension, or Dismissal.

## IV. Hazard Identification, Evaluation, and Inspection

Job Hazard Analyses and worksite inspections have been established to identify and evaluate occupational safety and health hazards.

### 1. Job Safety Analysis:

Job Safety Analysis (JSA) identifies and evaluates employee work functions, potential health or injury hazards, and specifies appropriate safe practices, personal protective equipment, and tools/equipment. JSA's can be completed for worksites, an individual employee's job description, or a class of employees' job description. Completed JSA's are located in **Appendix B**.

The following resources are available for assistance in completing JSA's:

- Laboratory personnel, please refer to the [Laboratory Hazard Assessment Tool](#)
- Non-Laboratory personnel, please refer to the [JSA/PPE Certification Forms](#)

### 2. Worksite Inspections

Worksite inspections are conducted to identify and evaluate potential hazards. Types of worksite inspections include both periodic scheduled worksite inspections as well as those required for accident investigations, injury and illness cases, and unusual occurrences. Inspections are conducted at the following worksites:

- 1) Location: **On-Campus Research Laboratories**  
Frequency: **Annual**  
Responsible Person: **EH&S and Fire Safety Officers, Lab PI or Lab Safety Manager**  
Records Location: **Electronics, Bainer 2101, and Lab Safety Binders**
- 2) Location: **Off-Campus Research Laboratories**  
Frequency: **Annual**  
Responsible Person: **EH&S Safety Officer, Lab PI or Lab Safety Manager**  
Records Location: **Electronics, and Lab Safety Binders**

Worksite Inspection Forms are located in **Appendix C** ([C1 - General Office](#) and [C2 - Laboratory](#)).

*(Example Worksite Inspection Forms are located in Appendix C of this template (C1 - General Office and C2 - Laboratory)).*

## V. Accident Investigation

University Policy requires that work-related injuries and illnesses be reported to Workers' Compensation within 24 hours of occurrence and state regulation requires all accidents be investigated.

**Mechanical and Aerospace Engineering employees** will immediately notify their supervisor when occupationally-related injuries and illnesses occur, or when employees first become aware of such problems.

1. **Supervisors** will investigate all accidents, injuries, occupational illnesses, and near-miss incidents to identify the causal factors or attendant hazards. Appropriate repairs or procedural changes will be implemented promptly to mitigate the hazards implicated in these events. Proper injury reporting procedures can be found at <http://safetyservices.ucdavis.edu/article/injury-reporting-procedure>.

The **Injury and Illness Investigation Form (Appendix D)** shall be completed to record pertinent information and a copy retained to serve as documentation. It can be completed by either the supervisor or the Department Safety Coordinator.

3. **Note:** Serious occupational injuries, illnesses, or exposures must be reported to Cal/OSHA by an EH&S representative **within eight hours** after they have become known to the supervisor. These include injuries/illnesses/exposures that cause permanent disfigurement or require hospitalization for a period in excess of 24 hours. Please refer to [EH&S SafetyNet #121](#) for OSHA notification instructions.

## VI. Hazard Correction

Hazards discovered either as a result of a scheduled periodic inspection or during normal operations must be corrected by the supervisor in control of the work area, or by cooperation between the department in control of the work area and the supervisor of the employees working in that area. Supervisors of affected employees are expected to correct unsafe conditions as quickly as possible after discovery of a hazard, based on the severity of the hazard.

Specific procedures that can be used to correct hazards include, but are not limited to, the following:

- Tagging unsafe equipment “Do Not Use Until Repaired,” and providing a list of alternatives for employees to use until the equipment is repaired.
- Stopping unsafe work practices and providing retraining on proper procedures before work resumes.
- Reinforcing and explaining the need for proper personal protective equipment and ensuring its availability.
- Barricading areas that have chemical spills or other hazards and reporting the hazardous conditions to appropriate parties.

Supervisors should use the **Hazard Alert/Correction Report (Appendix A)** to document corrective actions, including projected and actual completion dates.

If an imminent hazard exists, work in the area must cease, and the appropriate supervisor must be contacted immediately. If the hazard cannot be immediately corrected without endangering employees or property, all personnel need to leave the area except those qualified and necessary to correct the condition. These qualified individuals will be equipped with necessary safeguards before addressing the situation.

## VII. Health and Safety Training

Health and safety training, covering both general work practices and job-specific hazard training is the responsibility of the **Principal Investigator** and immediate Supervisor(s) as applicable to the following criteria:

1. Supervisors are provided with training to become familiar with the safety and health hazards to which employees under their immediate direction and control may be exposed.
2. All new employees receive training prior to engaging in responsibilities that pose potential hazard(s).
3. All employees given new job assignments receive training on the hazards of their new responsibilities prior to actually assuming those responsibilities.
4. Training is provided whenever new substances, processes, procedures or equipment (which represent a new hazard) are introduced to the workplace.
5. Whenever the employer is made aware of a new or previously unrecognized hazard, training is provided.

The **Safety Training Attendance Record** forms are located in [Appendix E](#).

## **VIII. Recordkeeping and Documentation**

Documents related to the IIPP are maintained in/at/on:

**Mechanical and Aerospace Engineering website, department safety coordinator's office in Bainer 2101, and individual laboratories (safety binders and/or electronics records).**

The following documents will be maintained within the department's IIPP Binder for at least the length of time indicated below:

1. Hazard Alert/Correction Forms (Appendix A form).  
Retain for three (3) years.
2. Employee Job Safety Analysis forms (Appendix B form)  
Retain for the duration of each individual's employment.
3. Worksite Inspection Forms (Appendix C form).  
Retain for three (3) years.
4. Injury and Illness Investigation Forms (Appendix D form).  
Retain for three (3) years.

The following documents will be maintained within the department's IIPP Training Records Binder for at least the length of time indicated below:

1. Employee Safety Training Attendance Records (Appendix E forms).  
Retain for three (3) years.

## **IX. Resources**

1. UC Office of the President: [Management of Health, Safety and the Environment](#), 10/28/05
2. UC Davis Policy and Procedure Manual, [Section 290-15](#), Safety Management Program
3. California Code of Regulations Title 8, Section 3203, ([8CCR §3203](#)), Injury and Illness Prevention Program
4. Personnel Policies for Staff Members, Corrective Action, [UC PPSM 62](#)
5. UC Davis Environmental Health & Safety
  - [Safety Services Website](#)
  - [EH&S SafetyNets](#)
  - [Safety Data Sheets](#)
6. [MAE department website](#) and department Safety bulletin down the hall from the administrative offices.

## **Appendices – IIPP Forms**

Appendix A: Hazard Alert/Correction Form

Appendix B: Job Safety Analysis

Appendix C1: Office Worksite Inspection Form

Appendix C2: Self-Inspection Checklist

Appendix D: Injury and Illness Investigation Form

Appendix F: Safety Training Attendance Forms

# Appendix A: HAZARD ALERT / CORRECTION FORM

Alert Identification No. \_\_\_\_\_

Department: \_\_\_\_\_

## I. Unsafe Condition or Hazard

Name: (optional) \_\_\_\_\_ Job: \_\_\_\_\_

Title: (optional) \_\_\_\_\_

Location of Hazard: \_\_\_\_\_

Building: \_\_\_\_\_ Floor: \_\_\_\_\_ Room: \_\_\_\_\_

Date and time the condition or hazard was observed:

Description of unsafe condition or hazard: \_\_\_\_\_

\_\_\_\_\_

What changes would you recommend to correct the condition or hazard?

\_\_\_\_\_

Employee Signature: (optional) \_\_\_\_\_

Date: \_\_\_\_\_

## II. Management/Safety Committee Investigation

Name of person investigating unsafe condition or hazard:

\_\_\_\_\_

Results of investigation (What was found? Was condition unsafe or a hazard?): (Attach additional sheets if necessary.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Proposed action to be taken to correct hazard or unsafe condition: (Complete and attach a Hazard Correction Report, IIPP Appendix E)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature of Investigating Party: \_\_\_\_\_

Date: \_\_\_\_\_

**IIPP-Appendix A  
January 2016**

Completed copies of this form should be routed to the appropriate supervisor and department Safety Coordinator, and must be maintained in department files for at least three years.

# HAZARD ALERT / CORRECTION REPORT

Alert Identification No. \_\_\_\_\_

Department: \_\_\_\_\_

This form should be used in conjunction with the “Hazard Alert Form” (IIPP Appendix A), as appropriate, to track the correction of identified hazards.

All hazards should be corrected as soon as possible, based on the severity of the hazard. If a serious imminent hazard cannot be immediately corrected, evacuate personnel from the area and restrict access until the hazard can be addressed.

Supervisor/Safety Coordinator Name: \_\_\_\_\_ Telephone: \_\_\_\_\_

Supervisor/Safety Coordinator Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Description and Location of Unsafe Condition	Date Discovered	Required Action and Responsible Party	Completion Date	
			Projected	Actual

**IIPP-Appendix A  
January 2016**

Completed copies of this form should be routed to the department Safety Coordinator and kept in department files for at least three years.

## Appendix B: Job Safety Analysis

Job Function	Potential Health or Injury Hazard	Safe Practice, Apparel, or Equipment
Performing work in laboratories containing chemicals.	Exposure to chemicals via inhalation, contact, ingestion or injection.	Avoid all unnecessary exposures. Reduce exposures that cannot be avoided by minimizing exposure duration and concentration. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personal hygiene habits, including washing hands and face before eating and smoking. All personnel to receive MAE Annual Safety training, site-specific training (Chemical Hygiene Plan or Hazard Communication Plan), UC Laboratory Safety Fundamentals, Hazardous Waste Management and Minimization Training and other applicable courses before beginning work.
Performing work in laboratories containing radiological materials.	Exposure to radiological agents via inhalation, contact, ingestion or injection.	Avoid all unnecessary exposures. Adhere to radiological material handling procedures including limiting exposures through combination of minimizing time, maximizing distances and use of appropriate shielding. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personal hygiene habits, including washing hands and face before eating and smoking. Participation in radiological monitoring program including dosimetry. All personnel to receive MAE Annual Safety training, site-specific training, Radiation Safety training and other applicable courses before beginning to work.
Performing work in laboratories containing biological materials.	Exposure to biological agents via inhalation, contact, ingestion or injection.	Avoid unnecessary exposures. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Proper adherence to blood borne pathogen handling protocols. Implementation of proper personal hygiene habits, including washing hands and face before eating and smoking. Voluntary participation in Hepatitis B vaccination program. Proper adherence to biological waste handling procedures. All personnel to attend EH&S Blood borne Pathogen Program training before beginning to work. Participation in Facilities- specific medical clearances as required.
Performing work in laboratories, shops and spaces containing physical hazards.	Injury from physical hazards including high voltage, lasers and ultraviolet light, compressed gases and liquids, cryogenic materials, and specialized equipment as well as falling objects.	Avoid unnecessary exposures. Proper selection and use of personal protective equipment including gloves, protective eyewear and specialized equipment. Employees are not to enter restricted areas unless accompanied by a properly trained individual familiar with the hazards of the area. Employees are not to operate specialized equipment without proper training and documentation. Watch for overhead hazards and wear head protection if needed. Personnel auditing or routinely entering areas where lasers are used will receive laser safety training before beginning work.
Performing work in laser laboratories.	Potential exposure to specular or diffuse reflections.	Avoid all unnecessary exposures to Class 3b and 4 laser beams. Intrabeam viewing is strictly forbidden at UC Davis. Proper laser safety eyewear is mandatory when the laser is activated unless the beam has been enclosed which effectively changes the class of the laser to a Class 1 (eye safe). When aligning the laser, power down with a visible beam, preferably a Class 3a HeNe. Alignment eyewear is available but once the laser is aligned do not assume that it is eye safe, wear your laser safety eyewear. When choosing proper eye protection one must take into account the power or energy and the wavelength of the laser or laser system. Contact the campus Laser Safety Officer to calculate the Optical Density for your eyewear or check with your Principle Investigator. Employees are not to operate lasers or laser systems without proper training and documentation. Employees or visitors must take the UC Davis Laser Safety Class and be trained on the specific laser they will be using. A Standard Operating Procedure must be in place for each laser or laser system before use. Be aware that there are ancillary hazards associated with the laser and take appropriate precautions.

Job Function	Potential Health or Injury Hazard	Safe Practice, Apparel, or Equipment
Handling and moving heavy items and equipment.	Ergonomic hazards including heavy lifting, repetitive motions, awkward motions, crushing or pinching injuries etc.	Get help with all loads that cannot be safely lifted by one person. Use mechanical means to lift and move heavy items, push carts and dolly rather than pull, attend back safety class, employ proper lifting techniques at all times. Set up work operations as ergonomically safe as practical. Wear proper hand and foot protection to protect against crushing or pinching injuries.
Operation of motor vehicles	Motor vehicle accidents involving personal injury, or property damage	All drivers of University vehicles must attend the Driver Safety Awareness Course offered by Fleet Services and possess a valid California driver license. Hazardous materials may not be transported in personally owned vehicles.
Exposure to noise hazards	Hearing loss due to noise exposure	Voluntarily participate in the Hearing Conservation Program. Use hearing protection as required.
General office work	Back strain, eyestrain, repetitive motion injury. Physical injuries due to slips, trips and falls, and falling objects. Electrical hazards. Physical injuries due to fires, earthquakes, bomb threats and workplace violence.	Ensure that workstations are ergonomically correct. Keep floors clear of debris and liquid spills. Keep furniture, boxes, etc. from blocking doorways, halls and walking space. Do not stand on chairs of any kind, use proper foot stools or ladders. Do not store heavy objects overhead. Do not top load filing cabinets, fill bottom to top. Do not open more than one file drawer at a time. Brace tall bookcases and file cabinets to walls. Provide one-inch lip on shelves. Do not use extension cords in lieu of permanent wiring. Ensure that high wattage appliances do not overload circuits. Use GFCIs in receptacles in potentially wet areas. Replace frayed or damaged electrical cords. Ensure that electrical cords are not damaged by being wedged against furniture or pinched in doors. Attend emergency action and fire prevention plan training including emergency escape drills. Plan for methods to seek help in case of a workplace violent situation.













3. The user has been fit tested by the Occupational Health Services.			
4. Cartridges are changed on designated schedule and are the appropriate cartridge for the hazard.			
<b>J. Laser Safety</b>	Yes	No	N/A
1. Does the laboratory use any Class 3b or 4 lasers?			
2. Are the lasers registered with EH&S Health Physics Program?			
3. Are the Standard Precautions for lasers prominently posted for each laser?			
4. Are appropriate warning signs and labels posted?			
5. Does the laboratory entrance have a warning light or lighted sign showing when the laser is in use?			
6. Have all workers attended the EH&S Laser Safety course?			
7. Does the laboratory have appropriate laser eyewear?			
<b>K. Non-Ionizing Radiation (NIR) Source</b>	Yes	No	N/A
1. Have proper warning signs been posted?			
<b>L. Emergency Planning &amp; Procedures</b>	Yes	No	N/A
1. Emergency Response Guide and evacuation map visibly posted and current.			
2. Chemical spill kit/cleanup materials available.			
3. Training in spill clean-up procedures provided and documented.			
4. First aid materials kept in adequate supply (in a sanitary and usable condition) and made readily available.			
<b>M. Fire Prevention</b>	Yes	No	N/A
1. Appropriate fire extinguisher mounted, unobstructed, available within 75 feet, in working order and inspected within the last year. A fire extinguisher should be available in a room containing flammable and/or combustible liquids.			
2. Fire extinguisher sign is clearly visible.			
3. 18-inch vertical clearance maintained from sprinkler head ( <i>i.e.</i> , over shelving).			
4. Are all laboratory doors kept closed? Closure devices in place?			
5. Storage of combustible material is minimized.			
<b>N. Exits</b>	Yes	No	N/A
1. Exits and aisles are clear and free of obstructions in case of emergency.			
2. Exit signs clearly visible.			

Notes: \_\_\_\_\_

\_\_\_\_\_

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