1. Introduction and General Administration

Laboratory Safety at the Georgia Institute of Technology (Georgia Tech) is a multi-faceted program managed by Georgia Tech Environmental Health and Safety (EHS) and includes programs in Biological Safety, Chemical Safety, Hazardous Materials Management, Fire and Life Safety, General Safety, and Radiological Safety. Program elements include but are not limited to: Fume Hood Certifications, Biosafety Cabinet Certifications, Laboratory Inspections, Laboratory Self Inspections, Industrial Hygiene, Laser Safety, High Magnetic Field Safety, and other programs addresses in this Laboratory Safety Manual. Questions or concerns about safety in Georgia Tech Laboratories can be directed to the Environmental Health and Safety Personnel: at 403-894-4635 (http://www.ehs.gatech.edu/organization/contacts.php)
GEORGIA INSTITUTE OF TECHNOLOGY

ENVIRONMENTAL HEALTH AND SAFETY POLICY

Ratified by the Institute Council on Environmental Health and Safety
August 2008

POLICY
Georgia Institute of Technology (Georgia Tech) is committed to:

Providing a safe, secure and healthy environment for all faculty, staff, students, and visitors;

Conducting its research and educational programs in compliance with applicable environmental health and safety laws and regulations; and

Demonstrating leadership in pollution prevention, waste reduction and the judicious use of resources for protection of human health, safety and the environment.

GUIDING PRINCIPLES
Good environmental health and safety practices, including compliance, are the responsibility of every faculty member, staff employee, student and visitor at Georgia Tech. This responsibility cannot be transferred or delegated.

Georgia Tech shall make all reasonable efforts to:

protect the health and safety of faculty, staff, students, visitors, and the surrounding community;

provide safe workplaces - academic, research and administrative;

provide information and training to faculty, staff, students and visitors about potential environmental, health and safety hazards;

develop and promote the adoption of environmental health and safety best practices;

identify and correct environmental health and safety hazards, and encourage the reporting of hazards and safety-related incidents;

work cooperatively with the City of Atlanta, the State of Georgia and regulatory agencies to promote a safe and healthy environment; and

comply with applicable environmental health and safety laws, regulations and consensus standards.

IMPLEMENTING AUTHORITY
The Georgia Tech Institute Council for Environmental Health and Safety is the principal implementing authority for this policy. The Council shall adopt, implement and integrate policies and procedures as developed by compliance oversight and other environmental health and safety committees at Georgia Tech.
The Georgia Tech Office of Environmental Health and Safety is responsible for providing technical guidance, oversight, consultation, training and specialized services to assist the Institute community in meeting its public health, safety and environmental protection responsibilities.
Purpose
The purpose of this manual is to provide basic safe operating practices to be applied uniformly in all Georgia Tech laboratories in order to ensure a safe environment in which to work and study for faculty, students, visitors, and staff. New situations and hazards arise in research every day. This manual, therefore, cannot possibly be an all-inclusive list of hazards or solutions to hazards found in Georgia Tech laboratories and research stations. Instead, it is offered as the foundation and guide to approach new challenges and discover ways of safely dealing with them.

Scope
The principles and practices found in this manual apply to all Georgia Tech laboratories including satellite locations and research stations both in the US and abroad.

Authority: Faculty-Led EHS Committees

Institute Council for Environmental Health and Safety (IC-EHS)
The IC-EHS is the over-arching faculty-led Institute safety oversight Council that coordinates policy recommendations, procedures, and practices from each of the Institute’s safety-related committees. The IC-EHS is appointed by the President of Georgia Tech and has the authority to approve new or change existing procedures with consultation and input from Council members.

IC-EHS membership is comprised of the Chairs of the Institute’s other faculty-led safety committees including the Institutional Animal Care and Use Committee, (IACUC), Institute Biosafety Committee (IBC), Biological Materials Safeguard Committee (BMSC), Campus Welfare and Security Committee (CWSC), Chemical and Environmental Safety Committee (CESC), Occupational Health and Safety Committee (OHSC), Radiological Safety Committee (RSC), Laser Safety Committee (LSC), as well as members from the Office of Research Integrity Assurance, the Office of Human Resources, Student Health Services, and EHS. The IC-EHS reviews the work of the various campus safety committees and has the authority to recommend disciplinary action, in accordance with Institute procedures, for violations of Georgia Tech safety rules.

Chemical and Environmental Safety Committee (CESC)
The CESC is responsible for reviewing and approving this manual and all safety practices and policies applied to GT laboratories; reviewing recent laboratory incidents; communicating trends and issues to the Georgia Tech IC-EHS and to Department Chairs; and recommending changes, as needed, in GT practices and policies.

Occupational Health and Safety Committee (OHSC)
The OHSC considers and advises EHS and the IC-EHS on programs and policies regarding occupational health and workplace safety at Georgia Tech.
Biological Materials Safeguards Committee (BMSC)

The BMSC considers and advises EHS and the IC-EHS on programs and policies regarding the safe and compliant use of non r-DNA biological materials and research protocols at Georgia Tech.

Institute Biosafety Committee (IBC)

The IBC reviews all registrations for research, teaching, and training that involve the use of r-DNA and ensures that the proposed activities comply with federal regulations and Institute policies. The IBC considers and advises EHS and the IC-EHS on programs and policies regarding the safe and compliant use of r-DNA biological materials and research protocols at Georgia Tech.

Radiation Safety Committee (RSC)

The RSC is responsible for maintaining the health and safety standards associated with the use of radioactive materials and ionizing radiation-producing devices at Georgia Tech and ensuring that research activities conform to State of Georgia Regulations. The RSC considers and advises EHS and the IC-EHS on programs and policies regarding the safe and compliant use of radioactive materials and radiation-producing devices at Georgia Tech.

Laser Safety Committee (LSC)

The LSC establishes and maintains safety policies, procedures and guidance regarding the use of class 3B and 4 lasers at Georgia Tech. The LSC considers and advises EHS and IC-EHS on programs and policies regarding the safe and compliant use of class 3B and 4 Lasers at Georgia Tech.

Laboratory Responsibilities

Deans

Deans are responsible for communicating the performance expectation to Department Chairs and Principal Investigators (PIs) that the practices and policies set forth in this manual are to be adhered to in all laboratories within their respective Colleges. Deans are responsible for setting the overall tone regarding establishing and maintaining a culture of safety in all laboratory operations under their control. Safety performance expectations must be clearly communicated to Department Chairs and PIs with the knowledge that disciplinary procedures will be pursued against those who fail to implement safety practices or willfully disregard safety practices and regulatory requirements.

Department and School Chairs

Department and School Chairs are responsible for ensuring that the practices and policies set forth in this manual are adhered to in all Georgia Tech laboratories under their control and for
communicating to lab personnel the expectation that a culture of safety is to be maintained in all labs and within all lab groups. Safety performance expectations must be clearly communicated to laboratorians, such as periodic self-inspections and safety meetings, prompt corrective actions when safety deficiencies are identified, and implementing disciplinary procedures for those who fail to work safely or willfully disregard safety practices and regulatory requirements.

**Principal Investigators (PIs)**

(PIs) have the primary responsibility for controlling hazards and maintaining compliance with applicable regulations and Georgia Tech policies in their laboratory(ies). This shall include promoting a safety culture in the work place by ensuring that all faculty, staff, and students are instructed in laboratory hazards and how to avoid them, holding periodic lab safety meetings, performing lab self-inspections, and ensuring that all lab users have received the required safety training as described in Chapter 11 of this manual.

**Laboratory Users**

Students, staff and faculty shall be responsible for complying with oral and written safety rules, regulations, and procedures required for the assigned task. Students, staff and faculty lab users are responsible for bringing any safety issues to the attention of the PI for appropriate corrective action.

**Environmental Health & Safety (EHS)**

EHS is responsible for guiding and assisting the Institute community in meeting its public health, safety, environmental protection and compliance responsibilities. EHS shall assist PIs and laboratory users in determining and following safe practices; coordinating safety activities; providing education in safety; investigating accidents and incidents in laboratories and chemical incidents campus wide; conducting lab inspections and verifying proper operation of lab safety equipment and systems. While lab safety programs are most effective when lab groups self-monitor and enforce the rules, EHS is also responsible for monitoring and verifying compliance with state and federal safety regulations and Georgia Tech lab safety policies. In cases of imminent danger to life and health of laboratorians and/or others nearby, EHS is authorized to take appropriate action including but not limited to stopping work, closing the laboratory, and evacuating laboratories or buildings.

The following table provides guidance as to how laboratory hazard levels are identified and responded to by EHS enforcement. However, this list is not all inclusive; individual circumstances will vary, and the most appropriate action will be taken:

**Institute Responses to Unsafe Actions and/or Unsafe Conditions in Laboratories**

**Level 1: Imminent Hazard with Potentially Severe Consequences**

Imminent hazard caused by unsafe conditions or unsafe actions which, in the judgment of the EHS representative on site, have the potential for severe consequences, and may result in

- Loss of life
• Serious injury with possibility of permanent damage to health or permanent disability
• Injury (including those by chemical exposures) likely to result in hospitalization
• May affect people outside of the lab
• May involve multiple victims
• May involve significant property damage, and/or building-wide business disruption and/or business disruption affecting the Institute

Examples of imminent hazards with potentially severe consequences that may result from unsafe conditions or unsafe acts include but are not limited to:
• Fires
• Floods
• Toxic or flammable gas releases or explosions
• Releases of highly toxic materials
• Releases of highly toxic materials to the environment
• Detonation of potentially explosive materials
• Run away reactions with the potential to cause any of the above
• Failure to use personal protective equipment or follow lab safety procedures while working with highly-hazardous substances such as pyrophorics or highly-energetic materials

Level 1 Response:
• Safely shut down process.
• If necessary, close lab to protect personnel, contain hazard, or to prevent re-entry by unauthorized personnel.
• Change locks if necessary.
• Situation report to PI, Chair, Dean, Provost, EVP of Finance and Administration, and AVP of EHS.
• For unsafe conditions: lab may open as soon as conditions are rectified to EHS satisfaction/approval
• For unsafe acts by individuals or unsafe practices by lab groups: lab re-opening and/or disciplinary actions to be determined by Chair, Dean and Institute Code of Conduct Procedures

Level 2: Imminent Hazard with Potentially Serious Consequences

Imminent hazard caused by unsafe conditions or unsafe actions which, in the judgment of the EHS representative on site, have the potential for serious consequences, and may result in:
• Temporary illness or minor injury
• May involve victim(s) receiving outside medical attention such as from an Emergency Room or Occupational Medicine Clinic, but is not likely to require hospitalization.
• May involve property damage and/or building-wide business disruption
Examples of serious events that may result from unsafe conditions or unsafe acts include but are not limited to:

- Exposures to one or more individuals to chemical, biological, or radiological materials
- Extremely poor housekeeping, improper segregation or storage of hazardous chemicals.
  Poor chemical hygiene
- Failure to use protective equipment or follow lab safety procedures while working with hazardous substances.
- Spills of chemical, biological, or radiological materials in a lab or in common areas
- Odor releases of know or unknown substances

**Level 2 Response:**

- Safely shut down process.
- If necessary, close lab to protect personnel, contain hazard, or to prevent re-entry by unauthorized personnel.
- Change locks if necessary.
- Situation report to PI, AVP of EHS
- For unsafe conditions: lab may open as soon as conditions are rectified to EHS approval
- For unsafe acts by individuals or unsafe practices by lab groups: additional situation reports to Chair, Dean, Provost, and EVP of Finance and Administration.
- For unsafe acts by individuals or unsafe practices by lab groups: lab re-opening and/ or disciplinary actions to be determined by Chair or Dean

**Level 3: Not Imminent Hazard but Potentially Serious Consequences**

Hazard caused by unsafe conditions or unsafe actions which, in the judgment of the EHS representative on site, have the potential for serious consequences.

Examples of Not Imminent Hazard but Potentially Serious Consequences are generally the same as described in Levels 1 and 2.

**Level 3 Response:**

- Situation report to PI, AVP of EHS
- Follow up in 24 hours
- If no response, additional situation reports to Chair and Dean

**Level 4: Not Imminent but Potential for Undesirable Consequences**

Hazard caused by unsafe conditions or unsafe actions which, in the judgment of the EHS representative on site, have the potential for undesirable consequences and may result in:

- Minor or minimally dangerous chemical spills
- Non- life threatening unplanned chemical reactions
- Increased risk of fire
- Increased risk of slips, trips, and falls

Examples of undesirable events that may result from unsafe conditions or unsafe acts include but are not limited to:
- Spills caused by poor housekeeping or clutter
- Unplanned reactions resulting from inappropriately stored chemicals or inadequately labeled waste
- Slips, trips, or falls caused by clutter, or by wires or tubing across walkways
- Adverse impact to indoor environmental quality in the lab and/or the building.

**Level 4 response:**
Situation report or Lab Inspection report to PI within 3 days
If no response or situation still uncorrected after 1 month – situation report to Chair and Dean

**Level 5: Repeat Violations/ Failure to Correct**
Hazard caused by unsafe conditions or unsafe actions which, in the judgment of the EHS representative on site, have the potential for Level 1-4 consequences
- For unsafe conditions- would include multiple deficiencies which have not been corrected by the lab group in the specified time period
- For unsafe acts by individuals or unsafe practices by groups would include repeated violation of basic safety rules including housekeeping, attire, and personal protective equipment

**Level 5 Response:**
- Situation Report to Dean/ Request for 1 week lab closure
- Close lab, change locks (PI to pay for lock shop services)
- Meet with PI and Chair
  - PI to present Chair and EHS with a written plan for correcting unsafe conditions and keeping the lab in the “corrected” condition to include stepped disciplinary procedures for persons who repeatedly demonstrate unsafe behavior
- Lab to reopen at a time mutually agreed upon by EHS, Chair, Dean, and PI, not to exceed 1 week (assuming that all unsafe conditions have been corrected).

**Other Circumstances:**
For certain situations such as repeated and willful disregard and/or failure to use personal protective equipment (PPE), or grossly inadequate housekeeping, EHS is authorized to take appropriate action up to and including closing the laboratory until EHS, the Department and
Disciplinary Actions

Any Georgia Tech student, faculty or staff member who fails to meet their responsibilities for safe conduct of work in laboratories or who knowingly and willfully disregard safety procedures will be held accountable and will be subject to disciplinary action in accordance with Institute procedures.

In addition, any visitors using Georgia Tech laboratories who fail to meet their responsibilities for safe conduct of work or knowingly and willfully disregard safety procedures or fail to comply with direct safety instructions from their Georgia Tech faculty sponsor, EHS or emergency response personnel regarding emergencies or evacuations will be held accountable and subject to loss of privileges to use Georgia Tech laboratory facilities. (NOTE: “visitors” may include contractors, visiting scholars and other non-Georgia Tech personnel.)