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<b>Title</b> 文件题目	Safety Instruction for the Engagement of Graduate Students in Labs 研究生参与实验室实验的安全指导	

#### Approval process 审批过程

	Name 姓名	Title 职务
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<b>Approved by</b> 批准人		Campus Safety Committee;

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RIGS 研究创新和研究生部	√	U.G. Dept. 本科教学部	√	I.T.Dept. 电脑信息部	√

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No 无

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## 1. Purpose 目的

Standardize the safety behavior and working requirements of the graduate students in research and in teaching laboratories to prevent incidents of personal injury, environmental pollution, asset and property damage.

规范学院研究生在实验室的安全行为和操作要求，避免发生人员伤害、环境污染和财产损失事故的发生。

## 2. Terminology 术语

- **EHS: Environment, Health, and Safety**
- **PI:** Principle Investigator 首席研究员
- **EHA:** Experimental Hazards Analysis 实验危害分析
- **GS:** Graduate Student, visiting students and scientists 研究生
- **GTIIT:** Guangdong Technion - Israel Institute of Technology

## 3. Scope of Application 范围

This Standard Procedure is applicable to the management of all labs and various working activities of all GS at GTIIT.

本标准操作规程适用于广东以色列理工学院(GTIIT)内所有研究生（包含访问学生和学者）在实验室的管理及各类操作活动。

## 4. Responsibilities 职责

**EHS office:**

**环境健康安全办公室:**

- Formulate the procedures and supervise the relevant departments to effectively implement various control measures;  
负责制定本程序，以及监督各相应部门对各个控制措施的有效落实；
- Collaborate with the research lab PI for lab safety and emergency training; the lab manager or administrator shall keep corresponding training records;  
协同实验室管理人员进行实验室安全应急培训，实验室管理员保留培训记录；

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#### Lab PI:

##### 实验室负责人:

- Responsible for the work arrangement and safety of the GS in the lab;  
负责研究生在实验室的工作安排和安全;
- Regularly assess the safety awareness of the GS and provide corresponding assistance and coaching;  
定期评估实验室研究生的安全意识, 并提供相应的协助和培训;
- Ensure the orderly development of GS work in the research lab, and report to the management when any abnormal case occurs.  
确保研究生在实验室各项工作的有序开展, 存在异常情况时及时汇报相应的管理层人员。

#### Lab manager (or researcher assigned by the PI):

##### 实验室助理 (实验室成员-可以是实验室经理, 研究员)

- Responsible for the implementation of safety regulations of lab instruments and equipment.  
负责实验室仪器和设备使用管理工作
- Assign responsibilities for particular parts of equipment.  
负责设备的安排工作
- Assist the graduate students on experimental lab facilities and equipment and corresponding safety work.  
协助研究生在实验室内所有实验设施设备、以及相应的操作安全工作;
- Abide by relevant management provisions in this article, and finish the assigned work.  
遵守本文的管理规定并完成受指派的工作职能;
- Supervise the GS in the lab to complete the necessary ability training for the lab.  
监督实验室内研究生完成实验所必须具备的能力培训;
- Timely report abnormal conditions to the PI.  
及时汇报异常情况至相应的实验室负责人;
- Accompany and supervise external personnel to enter the lab.  
负责外部人员进入实验室陪同工作;

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#### **Director of a central research or teaching facility 公共实验负责人**

- Responsible for all experimental lab facilities, equipment and corresponding operational safety work.  
负责的公共实验室内所有实验设施设备、以及相应的操作安全工作；
- Evaluate safety and feasibility for using the public lab.  
评价使用该公共实验室的实验安全和可行性；
- Responsible for the implementation and management of the laboratory, and the right to stop any violations, abuse of equipment and facilities, and activities beyond the scope of the experiment.  
负责公共实验室实施管理，有权制止任何违规、滥用设备设施、超实验范围的活动。
- Set up and keep a logbook for all users and their experiments in lab.  
实验室的通过实验日志记录实验活动。

### **5. General Requirements for Lab Safety 实验室一般安全规定：**

#### **5.1. In the lab (including PI's own lab)**

适用于研究生的实验室(包含该研究生导师的实验室)安全要求：

- Every GS will be paired with a specific mentor (lab member - can be lab manager, researcher, graduate student);  
每个研究生将与特定的导师配对（实验室成员-可以是实验室经理，研究员）；
- EHA risk assessment is undertaken before starting new experiments, the EHA should be approved by Lab PI. (For EHA form, please refer to the attachment)  
实验前，实验应通过实验危害分析，并得到实验实验室首席研究员的批准。(实验危害分析表请详见附件内容)
- Each workplace area displays a work sheet with the name of experimentalists and supervisor together with the hazards and referral to EHA.  
每个实验室内均配备一份工作表，表内标明实验人员和主管的姓名，依据实验危害分析表简述实验危害信息。
- Maximum people (students and lab members) to be defined for each research lab (Take a research lab of 80 areas with 4 personnel simultaneously as an example, the headcount can be adjusted accordingly) performing experiments at any given time.

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实验室每次最多只允许容纳 4 人同时（含学生和实验室人员）在一个科研实验室内同时进行实验；

- GS and mentors will sign off to follow GTIIT safety guidelines, they be trained for use of equipment, and know and accept additional regulations.

研究生和导师将书面确认他们将遵守 GTIIT 安全准则，将接受设备使用方面的培训，并且他们知道并接受这些额外准则；
- All GS experiments must be carried out under the guidance of the mentor according to the EHA.

研究生在实验室内进行的实验（实验危险性根据实验危害分析进行判断）必须在实验室教员指引下进行；(实验危险评估表请参考附件)
- The EHA must be established before the experiment. It needs to identify potential risks, determine all control measures, and understand the operation of various measures.

在实验开始前，必须完成实验危害评估、辨识潜在风险、确定所有相应的控制措施，并了解各项措施的操作；
- The mentor should complete the hazard evaluation according to the experimental evaluation form, the evaluation result can be stored in the lab, and a scanned copy should be sent to the EHS office.

实验室导师根据实验评价表格完成实验危害评价，评价结果实验室保存，扫描件发送至 EHS。
- Before graduate students start their experiments, the mentor must make sure that they are familiar with the safety instructions.

研究生实验时，负责导师必须确保所有研究生熟悉实验安全注意事项；
- The GS can do experiments only in presence of the student assigned lab member (or a replacing lab member) during the first 2 months of training, and during training or use of new equipment;

在培训的前两个月以及在培训或使用新设备的过程中，研究生只有在指派的实验室成员（或替换实验室成员）在场的情况下，才可以进行实验；
- When the GS is at training period who runs an experiment, he/she can only leave the lab with permission of the assigned lab member;

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研究生进行实验期间，只有得到指定实验室成员的许可，他/她才能离开实验室；

- The student conducting the experiment must use the corresponding equipment and instruments according to the instructions of lab manager. Operating equipment outside the scope of this experiment is prohibited.

进行实验的学生必须依据实验室负责人的指引使用相应的设备和仪器，非本次实验范围的设备，禁止进行操作；

- After the completion of the experiment, the GS conducting the experiment must restore the lab equipment and facilities according to the lab requirements (e.g.: lab equipment, daily sanitation, water and electricity, safety facilities and equipment, tidiness, etc.);

实验结束后，进行实验的学生必须按照实验室的要求恢复实验室的设备和设施（如：实验设备、日常卫生、水电、安全设施和设备、整洁度等）；

- Experimentalists and GS update requirements for the logbook.

实验完成后，进行实验的学生必须按实验室要求恢复实验室设备和设施状态（包括：实验室使用仪器、日常卫生、水电、安全设施设备等等）；

- All chemicals in containers, bottles, flasks have to be labeled according to its contents. This also holds for bottled water or solvents.

实验室内的所有化学试剂容器必须根据相应内容做好标签标识，对于水和溶剂同样适用。

- Chemicals for a specific person should be labeled with their name or project

专属的化学药品应做好相应的归属和品名信息备注。

- Between periodic or non-continuous experiments, all chemicals and equipment have to be stored temporarily according to the specified storage requirements to avoid misuse by others;

在定期或不连续的实验之间，所有暂存的化学药品和设备必须根据储存要求进行存放和布置，以免被他人误用。

- Occupied work-benches have to carry the information sheet and should be clearly distinguished from neighboring workplaces.

被占用的工作台必须标明相关实验信息，并应与邻近的工作场所明确区分开来。

- Private research labs are currently open from 08:00 to 22:00 according to the actual arrangement of lab manager. In case of special circumstances, the lab can extend its

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working hours after communicating with the property service center of the lab building in advance.

独立科研实验室目前根据实验室负责人需求，目前开放时间一般为上午 08:00 至晚上 22:00，如遇特殊情况，实验室提前和实验楼物业中心沟通后可延长工作时间。

- No alone (one person) hazardous experiments are allowed out of working hours (08:00-22:00), such as but not limited to the use of flammable and explosive or highly toxic materials.

不允许在非正常工作时间(08:00-22:00)进行单独(一个人)危险实验，例如但不限于使用易燃易爆或剧毒材料。

- Other experimental safety requirements must be implemented in strict accordance with the lab safety instruction and lab general safety regulations; those will not be repeated here.

其他实验安全事项，必须严格依据实验室安全指引和实验室一般安全规定执行，在此不再冗述。

## 5.2. In a central facility research lab (e.g. electron microscopy, X-rays etc.)

在公共研究实验室（如电镜、X 射线、质谱实验室等等）的一般要求：

- Before entering a public lab, an application for lab use must be submitted to the person in charge of the relevant lab;

进入公共实验室前，必须向相关实验室负责人提出实验室使用申请；

- An EHA or lab-relevant experimental evaluation form shall be submitted which will be evaluated by the person in charge on risk, records and arrangement of experimental equipment according to the lab status, and setting the granted experimental time;

提交相关的实验评价表格，由公共实验室负责人对相应实验的危险性进行评价，并由公共实验室负责人进行备案、根据实验室现状安排相应的实验设备和仪器、设定相应的实验时间；

- Experiments that fail the evaluation and permission shall not be carried out

未通过评价和许可的实验，不得进行；

- The experiment time must follow the arranged time set by the lab manager;

实验时间根据实验室负责人安排时间进行；



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- The open period of the central facility research lab is carried out according to the time arranged by the lab manager, normally from 08:30 to 17:30, if the user need to extend the using time, he/she need to apply with the lab manager, when getting approval which can be extended to 22 :00.

开放（共享）实验室使用根据实验室负责人安排时间进行，一般为上午 8 点 30 分至晚上 17 点 30 分，如果需要延长实验室使用时间则需和实验室负责人申请，可延长至晚间 22 点。

- Without the permission of lab manager, it is prohibited to extend the use of the lab without permission.

未经实验室负责人许可，禁止私自延长实验室使用时间。

- The lab user signs in and out in the logbook. According to the lab, he may fulfill other logging and reporting tasks.

实验室用户在日志中进行实验室使用登记（登入和登出）。根据实验室要求，实验室使用人员应完成实验室要求的其他日志记录和报告任务。

### 5.3. In a Teaching Lab (either preparing an experiment for the students or using the facility for their own research)

在教学实验室（为学生准备的实验室或者用于研究的实验室）的一般要求

- Before using the teaching lab for experiments, the applicant must submit an application to the lab manager; the applicant can enter only after permission and approval of lab manager; 使用教学实验室进行实验前，必须向实验室管理员提出实验室的使用申请，在得到实验室管理员许可和审批后，方可进入；
- The user submits an EHA to be evaluated by the person in charge on risk and to be recorded. 提交相关的实验危害分析评价表，由教学实验室负责人对相应实验的危险性进行评价，并由教学实验室负责人进行备案；
- The lab manager will arrange the corresponding experimental equipment and instruments and set the experimental time according to the current situation; 实验室负责人就实验室使用人员申请，根据实验室现状安排相应的实验设备和仪器、设定相应的实验时间；



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External equipment to be brought into the lab must be risk assessed and approved by the lab manger according to safety regulations. Before operation, it shall be installed or approved by the lab manager.

实验人员如需使用实验室以外的设备或仪器，需由实验室负责人许可后方可带入相应实验室，并在实验室负责人指导下进行安装和使用；

- Upon experiment completion, the experimentalist should collect all chemicals, experimental materials and instruments that are not part of the teaching experiment, and restore the lab equipment and facilities according to the requirements of the lab (e.g.: lab equipment, daily sanitation, water and electricity, safety facilities and equipment, etc.);
- Experimental waste to be disposed according to standard waste disposal guiding.

实验结束后，实验人员应回收不属于教学实验的药品和仪器，按实验室要求恢复实验室设备和设施状态（包括：实验室使用仪器、日常卫生、水电、安全设施设备等等）；

实验废弃物根据学校相关废弃物标准处置流程进行。

- Teaching experimental period is from 08:00: to 20:00; specific times depend on the opening hours of the teaching lab course and lab building.

正常教学实验室教学时间为上午 8 点至晚上 8 点，具体时间根据教学实验楼和实验课程的开放时间；

- GS experiments should not be conducted during undergraduate teaching experiments;

研究生实验不应与本科教学实验在同一实验室内同一时间段进行；

- It is prohibited to extend the use of the lab without permission of the lab manager.

未经实验室负责人许可，禁止私自延长实验室使用时间。

- The normal opening hours of the teaching lab is from 8:00 to 20:00. If the user needs to perform operations outside of this time period, they must apply to the lab manger to extend the experimental time.

After obtaining the permission of lab manager, fill in the lab extension application form with lab, users name, and send the form for approval to campus EHS office, the lab building administrator and the campus clinic mailbox;

教学实验室正常开放时间为上午 8 点至晚上 20 点，如需在此时间段之外进行实验操作，必须向实验室负责人提出延长实验时间的申请。

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在得到实验室负责人的许可后，填写实验人员、名称、实验室延长使用时间申请表，并将签字批准的表格发至学校安全办公室、实验楼管理员和医务室值的邮箱；

6. Attachment 附件

Experimental Hazard Analysis 实验危害分析表