

# **Engineering and Industrial Technology Education Facilities Guide**

Size and arrangement of an Engineering and Industrial Technology (EIT) Education laboratory will depend upon the specific EIT program or course being taught. Many EIT laboratories have common facilities. EIT facilities vary in size from 2,000 to 6,000 square feet.

## **A. Classrooms and Laboratories**

1. All classrooms and laboratories must meet all fire codes.
2. A fire extinguisher, blanket, and first aid kit should be provided.
3. All classrooms and laboratories must meet all South Carolina Department of Health and Environmental Control codes.
4. All classrooms and laboratories should be designed to accommodate individuals with physical disabilities.
5. Electrical and data outlets should be placed throughout the room and spaced for either computer workstations or laptops.
6. A master switch to turn off all equipment and water should be available to the teacher in case of an emergency.
7. Emergency lighting should be provided.
8. Classrooms/laboratories should be air-conditioned.
9. All equipment and appliances should include the latest technology and meet business/industry standards.
10. A television with a media player should be provided for instructional purposes. The television should have cable connections for instructional programming.
11. An overhead projector, a computer projector, and a large screen or smart board should be provided for instructional purposes.
12. Proper electrical service should be provided to each laboratory. The school administration, architect, and utility company should determine the needed power supply.

13. At least five computers with computer desks and ergonomically designed chairs should be provided for classroom use, except in classes where the number of computers is specified. Computers purchased should include the latest in technology such as CD and DVD drives, network cards, large hard drives, enough RAM to handle the latest software used in business, read/write/rewrite CD drives if possible, and the fastest affordable processor with industry-standard graphics and sound cards. Sufficient current and outlets must be provided for the equipment.
14. All computers should have Internet access and network capabilities.
15. The classroom should be equipped with at least one color printer, a scanner, a laser printer, a digital camera (or camcorder), and software to meet the state competencies for the course(s) taught in the lab.
16. All tables and computer workstations should have a cord management feature for safety reasons.
17. Surge protection should be provided, especially if computers are located in the classroom.
18. The layout of the room should allow the teacher to easily view all computer screens.
19. A whiteboard (4 feet x 16 feet minimum) and a bulletin board (4 feet x 8 feet minimum) should be installed.

## **B. Teacher's Office**

1. The teacher's office should be 120 to 150 square feet at a minimum and should be equipped with a telephone, networked computer, and printer.
2. Adjustable shelving at least 10 inches deep should be installed on one wall.
3. The office should have at least one tempered glass window for observation of all areas.
4. The office should be air-conditioned.

## Architecture and Construction Cluster

For additional information, you may contact Steven Watterson, Education Associate at the South Carolina Department of Education, (p): 803-734-8267 or (e): [swatterson@ed.sc.gov](mailto:swatterson@ed.sc.gov).

Course Titles	Activity Codes	Square Footage*
HVAC Technology 1, 2, 3, 4	6003, 6004, 6005, 6006	4,100
Building Construction Cluster 1, 2, 3, 4	6060, 6061, 6062, 6063	4,100
Carpentry 1, 2, 3, 4	6091, 6092, 6093, 6094	4,100
Cabinetmaking 1, 2, 3, 4	6080, 6081, 6082, 6083	
Electricity 1, 2, 3, 4	6287, 6288, 6289, 6290	3,600
Introduction to Construction	6001	4,100
Masonry 1, 2, 3, 4	6250, 6251, 6252, 6253	3,100
Plumbing 1, 2, 3, 4	6280, 6281, 6182, 6183	3,600

\* Recommended minimum square footage. The minimum recommended laboratory size includes a classroom (500 to 600 square feet), a tool room, a storage area, and a teacher's office (at least 100 square feet). Laboratory sizes are designed for one teacher; laboratory square footage should be increased for multiple instructors.

These courses listed above should include a laboratory area, project work area, classroom, teacher's office, storage room, tool room, and locker room.

### Laboratory Area

1. The lab should have level, concrete floors and a ceiling height of 14 to 16 feet from the concrete floor to the bottom of the steel bar joists.
2. A dust collection system, an exhaust system, and an air purification system should be installed.
3. Adequate bus bars and appropriate disconnect switches should be installed. Dual electrical receptacles should be placed on the walls at 10-foot intervals, 42 to 48

inches from the floor, and multiple 120-volt drops should be placed over the work benches and other appropriate work areas.

4. A foot-operated hand washing basin and an industrial sink with hot and cold water should be installed.
5. A drinking fountain should be installed in the laboratory area.
6. Compressed-air lines connected to an air compression system should be installed in locations throughout the lab.
7. A spray booth with one compressed-air line and shelving for paint storage should be provided if necessary for a program such as cabinetmaking or auto collision repair.
8. An overhead door (14 feet x 14 feet) and a personnel door should lead outside to a six-foot paved apron. A water (rain) stop should be installed at the bottom of the overhead door.
9. At least one hose bibb should be installed inside the laboratory, and one hose bibb should be installed outside. A shut-off valve for the outside hose bibb should be placed inside the building.

### **Project Work Area**

A project work area should be provided for students to work on large class projects.

### **Classroom**

1. The classroom should occupy 500 to 600 square feet of space at a minimum and should have a nine-foot ceiling of acoustical tile.
2. Dual electrical receptacles should be installed on all four walls, and three-way electrical toggle switches should be installed at each lab entry door.
3. It is recommended that the classroom and teacher's office be covered with vinyl or tile over concrete.

### **Teacher's Office**

The office should have an acoustical tile ceiling with a height of seven to nine feet and a vinyl or tile-over-concrete floor.

## **Tool Room**

1. At least 200 square feet should be provided for a tool room.
2. The tool room should be fitted with a Dutch door. The lower half of the door should have a shelf for dispensing and receiving tools. The Dutch door should have a locking device.
3. At least one wall of the tool room should be fitted with a counter that has cabinets above and below. A second wall should be fitted with a counter that has pegboard above and shelving at least two feet deep below. At least two dual electrical outlets should be installed above each counter.

## **Storage Room**

1. A lockable storage room should occupy a minimum of 200 square feet.
2. Two dual electrical receptacles should be provided.
3. The room should be fitted with shelving and cabinets.

## **Locker Room**

A locker room occupying 100 to 150 square feet at a minimum should be provided for students to change clothes.

## Manufacturing Cluster

For additional information, you may contact Steven Watterson,  
Education Associate at the South Carolina Department of Education,  
(p): 803-734-8267 or (e): [swatterson@ed.sc.gov](mailto:swatterson@ed.sc.gov).

<b>Course Titles</b>	<b>Activity Codes</b>	<b>Square Footage*</b>
Electronics Technology 1, 2, 3, 4	6133, 6134, 6135, 6136	3,100
Mechatronics Integrated Technologies 1, 2, 3, 4	6210, 6211, 6212, 6213	3,600
Introduction to Manufacturing	6045	3,600
Machine Technology 1, 2, 3, 4	6230, 6231, 6232, 6233	4,600
Metal Fabrication 1, 2, 3, 4	6260, 6261, 6262, 6263	3,600
Welding Technology 1, 2, 3, 4	6340, 6341, 6342, 6343	3,600
* Recommended minimum square footage. The minimum recommended laboratory size includes a classroom (500 to 600 square feet), a tool room, a storage area, and a teacher's office (at least 100 square feet). Laboratory sizes are designed for one teacher; laboratory square footage should be increased for multiple instructors.		

These courses need a facility that includes a laboratory area, classroom, teacher's office, tool room, storage room, and locker room to successfully complete the competencies. See facility diagram.

### Laboratory Area

1. The lab should have level, concrete floors and a ceiling height of 14 to 16 feet from concrete floor to bottom of steel bar joists.
2. An adequate lighting, heating, and ventilation system, to include an exhaust system, should be installed when applicable.

3. Dual electrical receptacles should be placed on the walls at 10-foot intervals, 42 to 48 inches from the floor; and one 220-volt cable tray should be placed in each lab.
4. A foot-operated washbasin with three sets of mixing faucets should be installed.
5. A drinking fountain should be installed in the lab area.
6. Compressed air lines should be provided on a laboratory wall, when applicable.
7. A whiteboard (4 feet x 16 feet minimum) and a bulletin board (4 feet x 8 feet minimum) should be installed.
8. Proper floor drains (2 feet x 2 feet) should be installed, where applicable.
9. Overhead door (14 feet x 14 feet) and personnel doors appropriate for the laboratory should lead to an outside paved area (6-foot apron). A water (rain) stop should be installed at the bottom of the overhead doors.
10. Adequate bus bars and appropriate disconnect switches should be installed when applicable.
11. Hose bibbs should be installed inside the laboratory, when applicable, and one hose bibb should be installed outside. A turnoff valve should be placed inside of the building for the outside hose bibb.
12. Proper electrical service should be provided to each laboratory. The school administration, architect, and utility company should determine the needed power supply.
13. An outside storage area is needed for gas and oxygen tanks, an air compressor, and a steam cleaner when applicable. The outside storage area should be secured with a chain link fence.

### **Classroom Space**

The classroom should occupy 500 to 600 square feet of space at a minimum and should have a nine-foot ceiling of acoustical tile. Dual electrical receptacles should be installed on all four walls, and three-way electrical toggle switches should be installed at each door. It is recommended that the floor be vinyl tile over concrete.

### **Tool Room**

1. At least 200 square feet should be provided for a tool room, which is compatible with and meets requirements of the laboratory.
2. The tool room should be fitted with a Dutch door. The lower half of the door should have a shelf for dispensing and receiving tools. The Dutch door should have a locking device.
3. A counter should be provided on one wall with shelf depth of at least two feet under counter, and at least one dual electrical outlet should be installed above the counter. A minimum of two storage racks should be provided.

### **Storage Room**

1. A lockable storage room should occupy a minimum of 200 square feet.
2. Two dual electrical receptacles should be provided.
3. Shelving or cabinets should be provided.

### **Locker Room**

A locker room occupying 100 to 150 square feet at a minimum should be provided for students to change clothes.

### **Teacher's Office**

The office should have an acoustical tile ceiling with a height of 7 to 9 feet and a vinyl-over-concrete floor.

**NOTE: SEE LABORATORY DIAGRAM FOR LAYOUT.**



# Laboratory Layout for Industrial Classes

