# ENERGY LEADERSHIP TRAINING

Energy Management Program
energy.okstate.edu

# OVERVIEW

- Energy Leadership Award
- Energy Leadership responsibilities
- HVAC at OSU
- Building envelope
- Windows/Blinds
- Dressing for comfort
- Impact of space heaters
- Comfort concerns and submitting work requests
- Scheduling events
- Ventilation Shutdown Exemption Request (VSER)

# Energy Leadership Award

# Award Details

- Recognizes student groups and campus departments for being active partners in reducing the University's energy expenditures.
- Facilitates understanding of utilities on campus and the impact of individual behaviors on energy use.
- Reinforces the importance of good energy stewardship in reaching the University's mission of education, research, and outreach.

# Award Details

- Faculty, staff, and students are responsible for implementing the OSU Energy Guidelines during the time within their classrooms, offices, and housing.
- Participants will gain a basic understanding of the following:
  - HVAC operations and scheduling
  - Building envelope
  - Plug load management
  - Impact of individual behaviors on energy consumption
- Award recipients will participate in other educational opportunities through OSU Energy Management.

# Heating Ventilation & Air-Conditioning (HVAC)

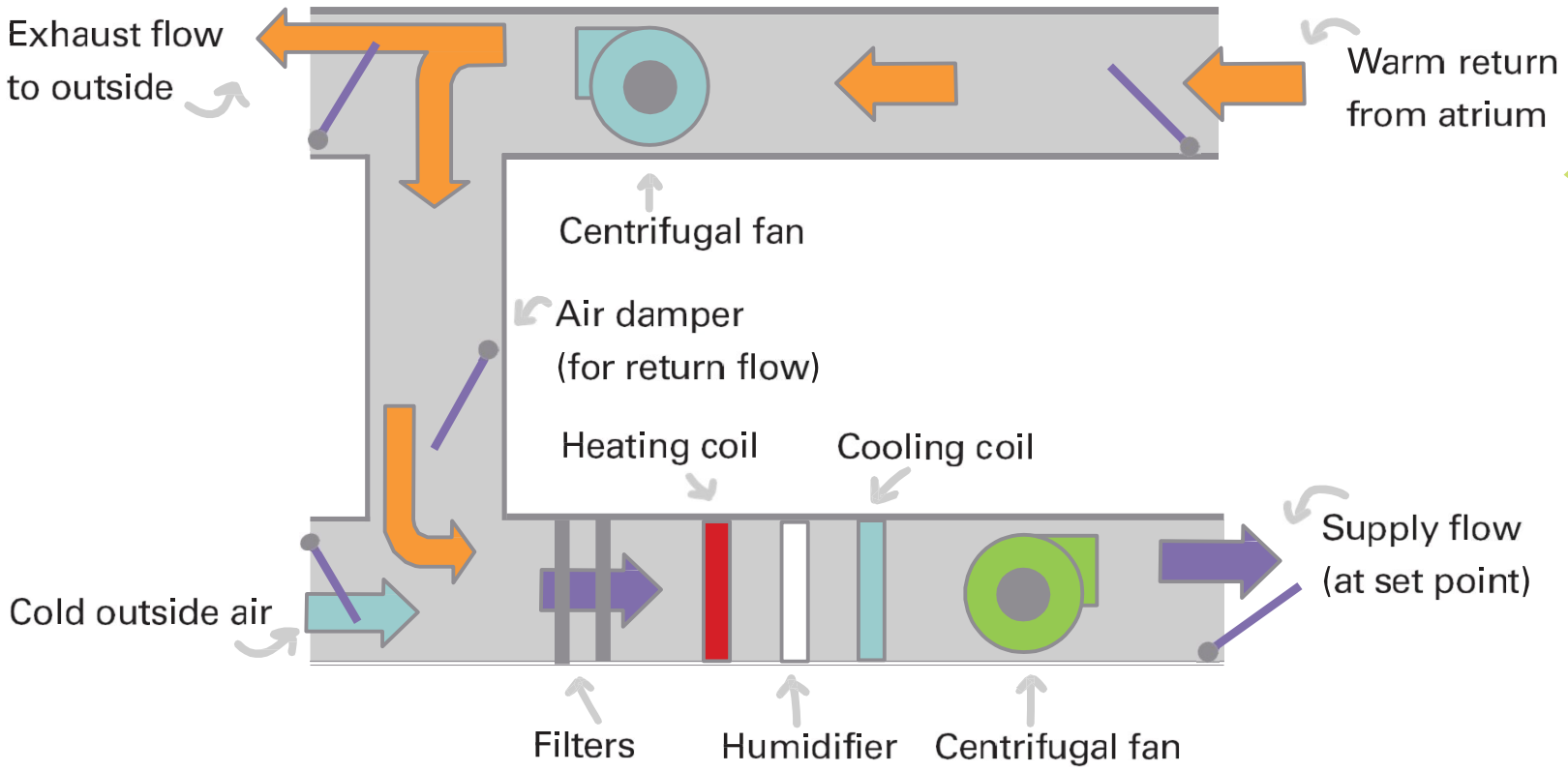
- Heating and cooling at OSU are provided through steam and chilled water in most buildings.
- Most buildings have more than one air-handling unit or air handler, which serve various areas called “zones” in the building.
- A *zone* is a space or group of spaces controlled by a single thermostat or sensor.
- Avoid blocking return air vents, as this restricts air flow.
- Placing heat-generating items or obstructing a thermostat or sensor can impact its ability to function properly, which can result in unfavorable temperatures for an entire zone.
- Many buildings are controlled remotely through a building automation system (BAS).

# HVAC: Setpoints

- OSU Energy Guidelines suggest the following temperature setpoints:
  - Cooling Season (occupied):
    74 - 78°F, 23 - 26°C
  - Cooling Season (minimally occupied)
    85°F, 29°C
  - Heating Season (occupied)
    68 - 72°F, 20 - 22°C
  - Heating Season (minimally occupied)
    55°F, 13°C

# HVAC

## Schematic of Air-Handler with recirculation from atrium



# HVAC

- OSU's HVAC includes large air handlers that use chilled water (CHW) and heating hot water (HHW) from steam, both produced at OSU's Central Plant.
- The CHW always provides 55°F - 60°F supply air, which may be tempered by the HHW from steam to balance the cooling.
- Air handlers have large fans that blow air across metal coils, heating and cooling, to condition the air.
- Unlike a home's HVAC system, where the fan may be turned on or off, the fans in OSU's buildings continue to run while an air handler is scheduled on.

# HVAC

- Air from supply vents may vary in temperature depending on the equipment design.
- Most areas do not have an adjustable thermostat because many buildings are operated by a Building Automation System (BAS), a computer system that controls the temperatures and operation of HVAC equipment.
- **Understanding how HVAC works on campus is important because it is the greatest user of energy resources!**

# Heat Gain & Loss

- Spaces continually gain heat from people, computers, appliances, and sunlight on exterior surfaces and windows. **Heat gain** may be due to:
  - Conduction through walls, windows and ceilings.
  - Infiltration - when warm outside air comes in or cool inside air leaks out. *(EX: An access door is left open and warm air enters the building while cool air escapes making it difficult to maintain indoor air temperatures.)*
  - Radiation from the sun, either direct or indirect, through windows, glass doors, skylights, etc.
  - Heat and moisture given off by people.
  - Heat given off by computers or appliances.
- **Heat loss** usually occurs in winter when cold air is working to get into a building, and warm air is trying to leave a building.

# Plug Load Management

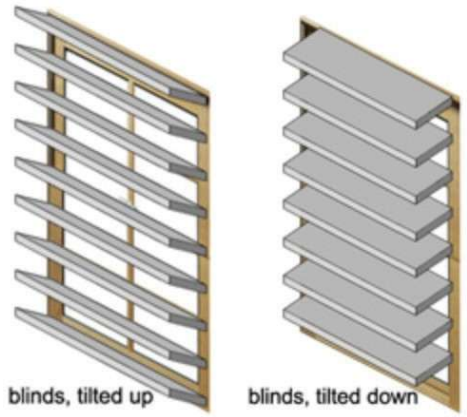
- **Plug load** is the energy used by products that are powered by means of an ordinary AC plug.
- Departmental refrigerators, coffeemakers, and microwaves are highly encouraged, but individual appliances waste a great amount of energy and money.
- Unplug any unnecessary devices or plug them into a power strip so they can be turned off quickly and easily with one switch.
- Turn off any electrical devices that are not in use, such as computer, monitors, lamp, DVR, DVD player, gaming system, chargers, etc.
- Ensure that computers, monitors and printers are in power save modes so that they power down after a maximum of 15 minutes of non-use.

# Building Envelope

- **Building envelope** refers to the physical barrier between the conditioned indoor and the unconditioned outdoor environment of a building. It plays an important role in determining the amount of energy necessary to maintain a comfortable indoor environment.
- **Building envelope** varies at OSU from the non-insulated native rock and wood of Old Central (1893), to the multi-story brick and insulated glass structure of the Spears School of Business (2016).
- **Building envelope** includes:
  - Structural frame
  - Moisture and air barrier
  - Insulation
  - Roof
  - Doors
  - Windows

# Building Envelope: Windows

- Spaces continually experience heat gain from people, computers, appliances, and sunlight on exterior surfaces and windows.
- **Keep windows closed and locked** to maintain the indoor environment, which includes keeping humidity and allergens out.
- **Close blinds and tilt them appropriately**:
  - UP - Reduces heat gain by minimizing sunlight allowed into the space. (summer)
  - DOWN - Increases heat load by allowing sunlight in. (winter)

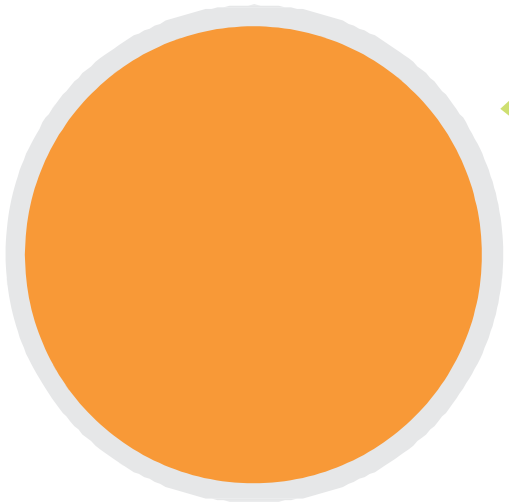


# Dressing for Comfort

- “Shoulder season” refers to the time of year when there is large temperature variation from morning to afternoon. Spring and fall may have cold mornings and very warm afternoons.
- When temperatures vary throughout the day, layered clothing is a good idea. Being able to add or remove layers as needed allows flexibility to maintain one’s own comfort level.
- Clothing and footwear that are seasonally appropriate are encouraged. Sweaters, thicker socks, and slacks are great for winter. Summer brings lighter-weight shirts, short sleeves, and seasonal footwear.
- If the indoor temperature is often too cool for you, consider keeping a light sweater with you throughout the day.

# Building Envelope: Doors

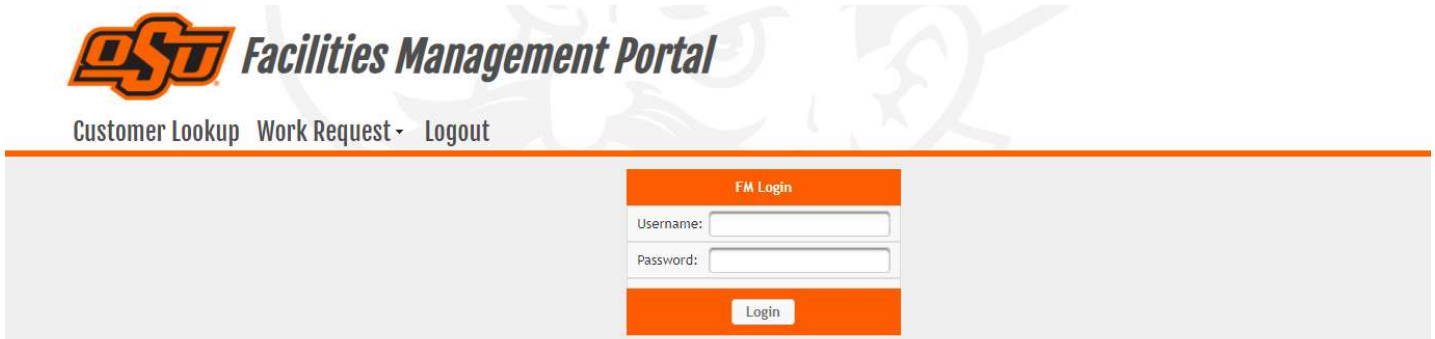
- Classroom doors should remain closed while HVAC is operating to keep conditioned spaces comfortable.
- Doors between conditioned space and non-conditioned space, such as a stairwell or hallway, should remain closed, if possible.
- Use the ADA Access button only when necessary. Doors stay open longer when using this option, allowing conditioned air to escape the building.
- Keeping doors closed as much as possible prevents outside humidity from infiltrating the building, ensuring better personal comfort.



# Impact of Space Heaters

- **Space heaters are highly discouraged at OSU** and are considered a fire hazard.
- If used in a space with a thermostat, a space heater can cause the HVAC system to operate based on false readings of the temperature in the area, thereby, making others uncomfortable.
- Rather than use a space heater, turn in a comfort complaint so that comfort issues may be addressed and corrected.

# Comfort Concerns




Comfort concerns may be turned in through the OSU Facilities Management Portal:

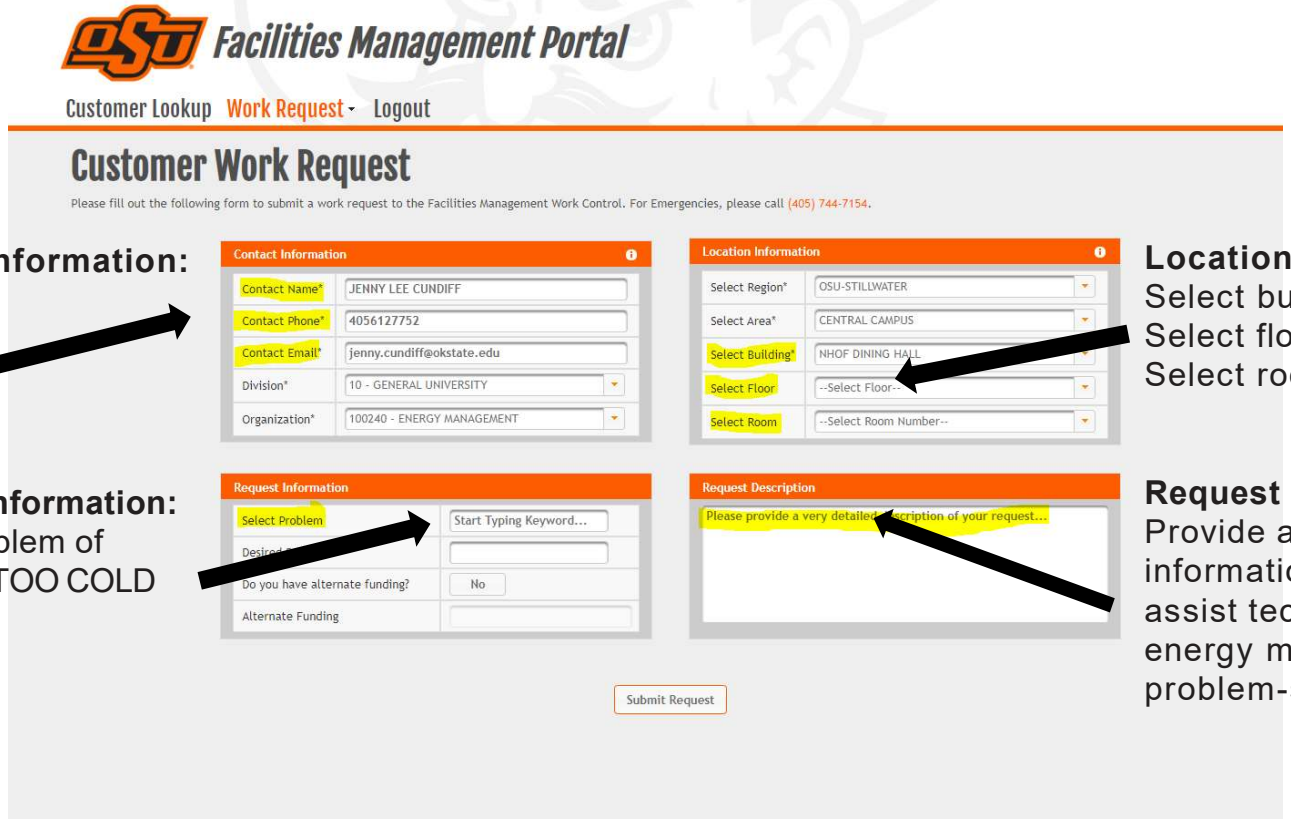
workorder.okstate.edu

# Ventilation Shutdown Exemption Request (VSER)

- The **Ventilation Shutdown Exemption Request (VSER)** is used to request additional HVAC run times outside the regularly scheduled hours in non-classroom spaces.
- The regular HVAC hours are dependent upon the working hours of 8:00 a.m. - 5:00 p.m. and class schedules.
- The Ventilation Shutdown Exemption Request form, as a printable pdf, may be found on the OSU Energy Management website: energy.okstate.edu/forms

# Work Request Guide:

**Quickly and easily submit a Customer Work Request at [workorder.okstate.edu](workorder.okstate.edu)**




**Contact Information:**
Name
Phone
Email

**Location Information:**
Select building
Select floor
Select room

**Request Information:**
Select Problem of
TOO HOT/TOO COLD

**Request Description:**
Provide any detailed information that might assist technicians or energy managers with problem-solving in your area.

# Room Scheduling Guide:

- Contact the Registrar's Office via email: GUrooms@okstate to schedule a room for an event or meeting.
- Allow two (2) full business days of notice for room/HVAC scheduling.
- **Scheduling a room for an event or meeting is important because...**
  - The room you wish to use may not be available to you if not scheduled.
  - Energy managers need to know where and when to schedule HVAC.
  - Scheduling allows ABM custodial staff to know when and where to unlock doors or to clean.
- If a room is NOT scheduled, HVAC may not be available.

# CONGRATULATIONS!

You have taken the first step toward earning the **Energy Leadership Award** for your organization.


**Please take the quiz via the link provided By your energy manager.**