



**UES INFO 001 – Existing Building Energy Requirements**

All UCF buildings and facilities, regardless of funding source, will be operated in the most energy efficient manner, without endangering public health and safety, and without diminishing the quality of education, research and service.

**Background**

The University of Central Florida has extensive building operation energy standard to help reduce volatility with growing energy costs, promote sustainable energy practices, and help protect our environment.

In order of magnitude, UCF’s main sources of emissions are: buildings, transportation, waste and natural resources management. Since 2007, the University has been committed to climate action through conservation, energy efficiency, effectively stewarding university resources, actively participating in the facilitation of sustainable growth, and inspiring the campus population to do the same.

Green building practices, maintenance and improvements on both new and existing facilities at UCF substantially reduce and eliminate negative environmental impacts through high-performance, cutting-edge design, construction, and operations. As an added benefit, green operations and management also play a significant role in reducing operation costs, enhancing UCF’s learning environment, increasing worker productivity, and reducing potential liability that can result from poor air quality.

**Intent**

UCF shall promote high-performance, healthy, durable, affordable, and environmentally sound practices in existing buildings. Utilities and Engineering Services (UES), Facilities Operations (FO), Landscape & Natural Resources (LNR), and Planning, Design, and Construction (PDC) will adopt and incorporate all aspects of the university’s Energy and Sustainability Policy into the ongoing maintenance operations programs. These programs will include modification and renovation of existing buildings, hardscapes, landscapes or structures, routine maintenance, preventative maintenance, and capital renewal.

UES will periodically review this Policy, as public awareness, management techniques, and technology improve to reduce greenhouse gas emissions associated with building systems.

**Indoor Environmental Conditions**

The requirements in this section balance occupant comfort, improve productivity, and support UCF’s energy conservation initiatives; environmental responsibility, and resource efficiency.

When engineers design university buildings, they use historic weather data to predict what future weather trends the building will likely experience. Heating and cooling equipment is sized to meet the environmental conditions 95% of the time. During extreme weather events, the equipment will not be able to meet the load and therefore, building occupants should dress accordingly to improve their personal comfort level.

Factors that define conditions for thermal comfort include, metabolic rate, clothing insulation, air temperature, radiant temperature, air speed and humidity. These factors vary with time. As a result, people entering a space may not immediately find the conditions comfortable if they have experienced different environmental conditions just prior to entering the space. The effect of prior exposure or activity may affect comfort perception for a short period of time.



The environmental conditions required for comfort are also not the same for every occupant. The activity level and clothing of the occupants may encounter substantial differences in thermal comfort over a duration of time. Adaptive comfort may be required for seasonal variation with some occupants, such as dressing in layers to adjust to personal hot, or cold

In addition, the university has adopted the latest American National Standards Institute (ANSI) / American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standards for cooling, heating, humidity control, ventilation rates and thermal comfort. These nationally recognized standards establish the minimum ventilation rates and other measures intended to provide indoor air quality acceptable to human occupants, and minimize adverse health effects. ASHRAE also prescribes a specific combination of indoor thermal environmental and personal factors that will produce thermal conditions acceptable to a majority of University occupants, while lowering energy expenditures.

### Space Scheduling

Weekends and holidays provide an opportunity for significant reduction in energy consumption on campus by reducing comfort settings. Buildings which are not occupied should be placed into a setback mode in which lighting levels are reduced to minimal safety levels, and set points for cooling, heating, and ventilation systems are adjusted to a less energy intensive level.

Campus users shall strive to consolidate classes and meetings to only core campus locations, especially during weekends and holidays. Classroom and meeting assignments should be made in such a way as to maximize the use of a few buildings, while leaving the majority of buildings unoccupied and available for setback conditions.

### OCCUPIED HOURS (Varies by building)

- When in cooling season, normal building set points will be 74° F; actual space temperature will range between 72° F and 76° F.
- When heating, normal building set points will be 70° F; actual space temperature will range between 68° F and 70° F.
- Outdoor air ventilation will be set to ASHRAE 62.1 guidelines or such other higher limits as prescribed by state law or regulations.
- Each building shall be aggressively scheduled to match the occupancy and shall be re-evaluated each year before peak cooling and heating seasons to determine opportunity for additional energy conservation.

### UNOCCUPIED HOURS (Varies by building)

- When cooling, normal building set points will be 82° F (or HVAC OFF), which can be lowered upon request, but not below 78° F.
- When heating, normal building set points will be 63° F (or HVAC OFF), which can be raised upon request, but not above 68° F.



- Intermittent operation of the A/C system during humid weather conditions on weekends and holidays will be permitted to maintain indoor relative humidity control.
- Outdoor air ventilation will be shut OFF or reduced. HVAC system start-up will begin 30 to 90 minutes prior to occupancy in order to flush accumulated air contaminants.
- UCF observed holidays will employ an un-occupied mode for common spaces / assembly / offices etc.

To support active research, these rules may be relaxed if special operating conditions (i.e. scientifically critical areas) so require.

### District Cooling

Chilled water is provided to over 70% of the main campus buildings, including many mission-critical research facilities, for general comfort cooling. Special equipment or needs for low temperature, low humidity, or high flow must be funded and provided by the end-user, who shall also be responsible for funding the maintenance and repairs for such special equipment after installation. The chilled water system may not be used to satisfy cooling requirements which exceed those provided for general environmental comfort cooling.

All exterior windows and building doors shall be kept closed when cooling systems are operating. This applies to **all** main campus buildings including E&G, DSO, AUX, and CITF facilities.

Independent distribution facilities (IDF), main distribution facilities (MDF) and modified data processing and server rooms are to be conditioned to within 10% of the maximum recommended space temperature, as stated by the original equipment manufacturer, and must have their own dedicated heat rejection to the space with redundancy. The end-user creating the need for additional data processing space shall bear the first cost of additional cooling and subsequent installation cost.

All new data centers located within the central chilled water distribution loop shall have dedicated chilled water fan coil units to provide adequate space conditioning. If a new data center is not located within the chilled water loop, the space shall be conditioned utilizing a dedicated direct expansion, or variable refrigerant flow unit.

### Lighting

The illumination levels specified by ASHRAE Standard 189.1 permit UCF to maintain power densities using proven lighting design principals to limit lighting power consumption and promote the safety of campus interior and exterior spaces. ANSI/ASHRAE/IESNA Standard 90.1-2010 prescribes suitable levels of illumination. UCF's exterior lighting standard requirements are documented in Addendum I to ANSI/ASHRAE/IESNA Standard 90.1-2010.

All indoor and outdoor specifications regarding lighting levels, lumen output, color rendering, efficacy and warranty specifications can be found in *UCF Design and Construction Standards Division 26 50 00*. In order to promote environmental stewardship, increase night-sky access and improve nighttime visibility, all outdoor lighting levels shall comply with the latest version of Leadership in Energy & Environmental Design (LEED) *Sustainable Sites Credit-Light Pollution Reduction*.



For classrooms, mechanical and electrical rooms, training and conference rooms, lecture halls and offices, occupancy sensor controls will adhere to ANSI /ASHRAE/ IESNA Standard 90.1 -2010, which automatically turns lights off within 30 minutes of all occupants leaving a space. Furthermore, all members of the university community should assume responsibility for turning off lights when leaving a room.

Lighting levels inside buildings will always be maintained at an appropriate level in order to ensure security. All lighting, except what is required by the life safety code, will be turned off when buildings are unoccupied, such as at the end of the workday. Housekeeping will turn lights back on only for the time actually required to work.

All indoor lighting will be LED, unless an exemption is specifically authorized for designated low usage fixtures. Personal desktop task lights should be LED as well. All indoor lighting levels will be surveyed and recorded by UES or FO. The lighting levels will be adjusted to the appropriate Illumination Engineering Societies (IES) recommendation for the task being performed in the space.

When existing lighting has achieved end of life in an office, classroom, conference room or utility rooms, and capital becomes available, new high-efficient lighting and occupancy sensors will be installed to reduce and/or turn off lights in unoccupied areas. As lighting technology evolves, new energy saving fixtures, lamps, and ballasts will be used to replace existing, less efficient lighting wherever appropriate. Existing incandescent lamps for general-purpose lighting will be phased out, and will not be installed unless an exemption is granted for extremely limited and specialized tasks.

### **Convenience Appliance Use**

Portable electric heaters and fans are prohibited in UCF facilities as personal space heater usage increases the risk of fire and utility demand, as well as causes improper operation of the heating and air condition systems. If a member of the university community feels that a space heater is necessary for adequate warmth, this may indicate the central heating system needs repair, and the Work Control Center should be immediately notified through the work order system.

Students living in the residence halls must also comply with the Housing and Residence Life Community Living Guide, detailing additional prohibited items.

All staff and faculty members are requested not to use personal refrigerators. Departmental refrigerators should be located in common areas, eliminating the need for units in personal offices. All other personal appliances, such as coffee pots, clocks, radios, and other peripheral office items, should be kept to a minimum and turned off or unplugged at night and during weekends and holidays. UCF community members are asked to take personal responsibility for turning off and unplugging all appliances when not in use.

### **Office Equipment**

All students, staff, and faculty should turn off personal computers when not in use for extended periods of time. Additionally, all personal computers shall be configured to automatically engage low power sleep mode in times of inactivity.



All new office equipment must meet or exceed the Energy Star ratings for high efficiency operation. Remaining legacy equipment should be replaced with energy efficient equipment as funding becomes available.

#### **Awareness and Education**

UES will foster and support the establishment and continued growth of energy awareness on campus. Educational programs and publications, promotional materials, and updated websites will keep the UCF community involved in the ongoing effort to conserve energy. UES shall solicit and evaluate feedback from the UCF community on the effects of its energy conservation efforts. Training on new energy management concepts and programs will be provided, as necessary.

UES will maintain the Energy Sustainability Policy, and notify the UCF community when significant changes occur. Suggestions for additional energy saving initiatives are welcome and can be submitted to [energy@ucf.edu](mailto:energy@ucf.edu).

#### **ADDITIONAL DOCUMENTATION:**

- ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality
- ANSI/ASHRAE/IES Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
- ANSI/ASHRAE/USGBC/IES Standard 189.1 Standard for the Design of High-Performance Green Buildings
- ASHRAE Standard 55 Thermal Environmental Conditions for Human Occupancy
- UCF Policy 3.111 - Energy Sustainability

<https://www.policies.ucf.edu/documents/3-111.pdf>