

# Bringing Solar-focused Knowledge into A Sustainable Building Course

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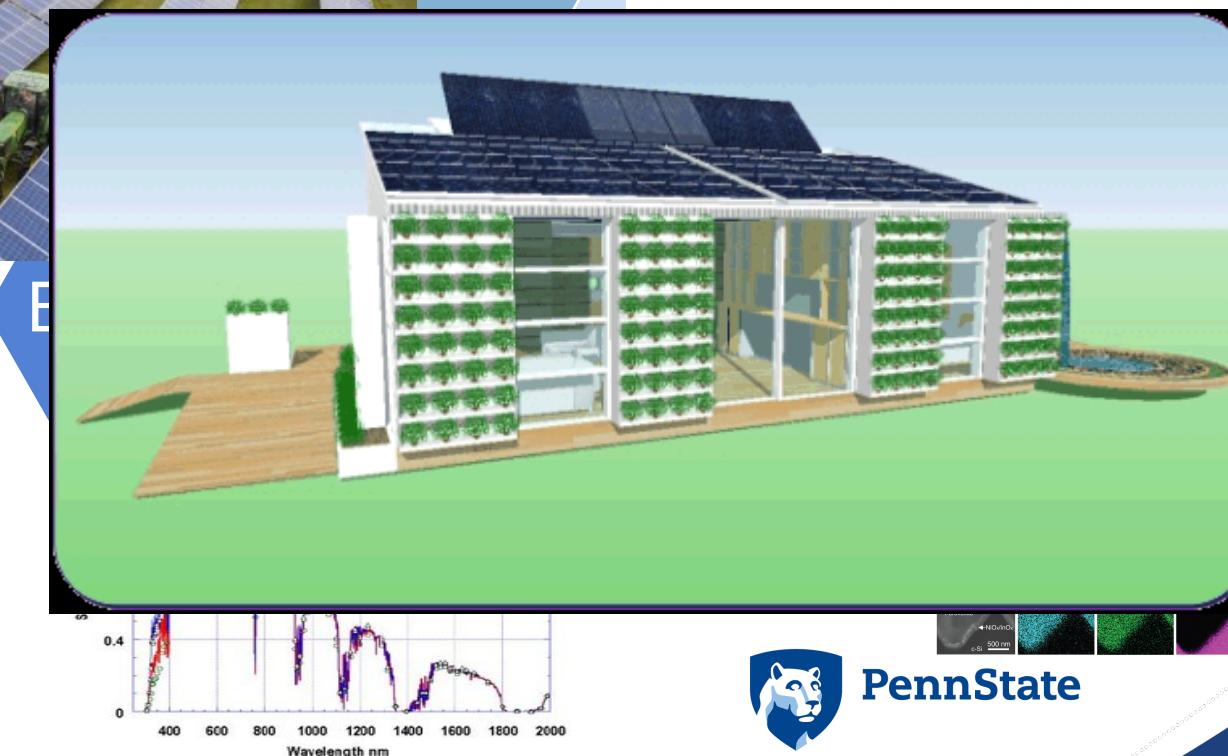
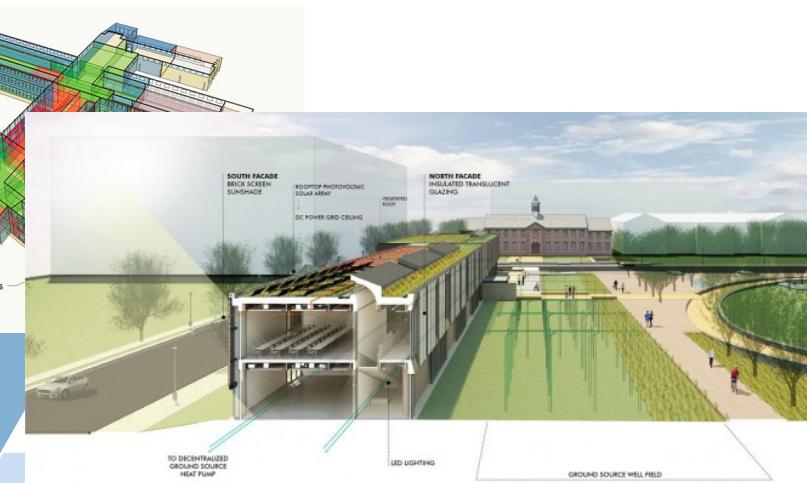
Associate Professor in Architectural Engineering

Affiliate Faculty in Materials Research Institute

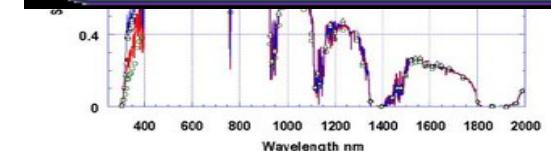
Pennsylvania State University



# Why did we bring this solar-focused education into PSU?



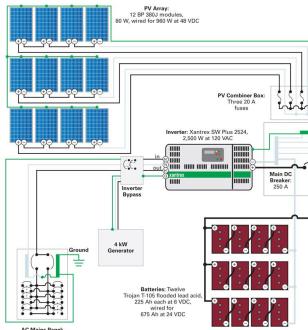
Electrical  
Engineering



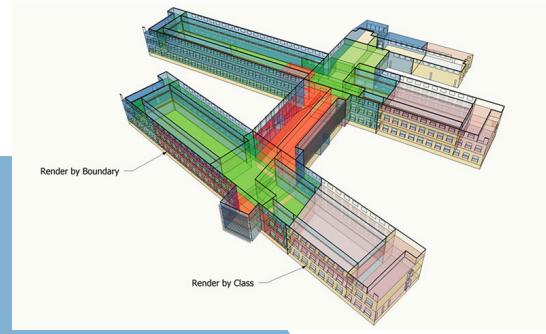
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## Architectural Design



## Electrical Engineering

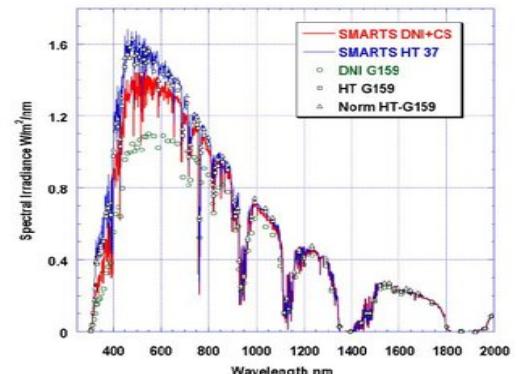


## Building Engineering

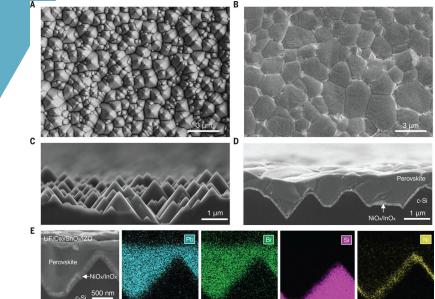


## Chemical Engineering

## Energy Engineering

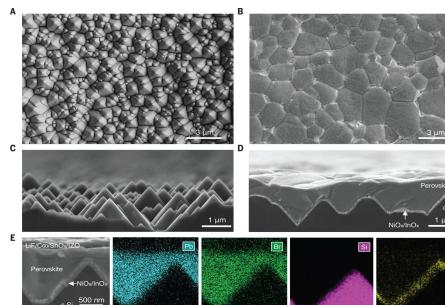
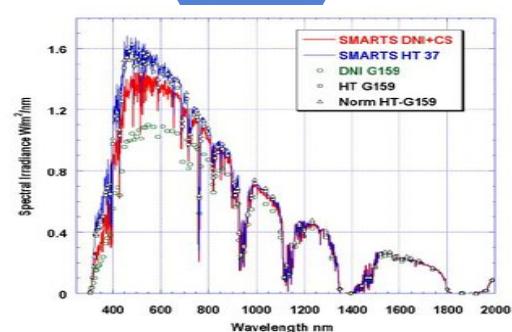
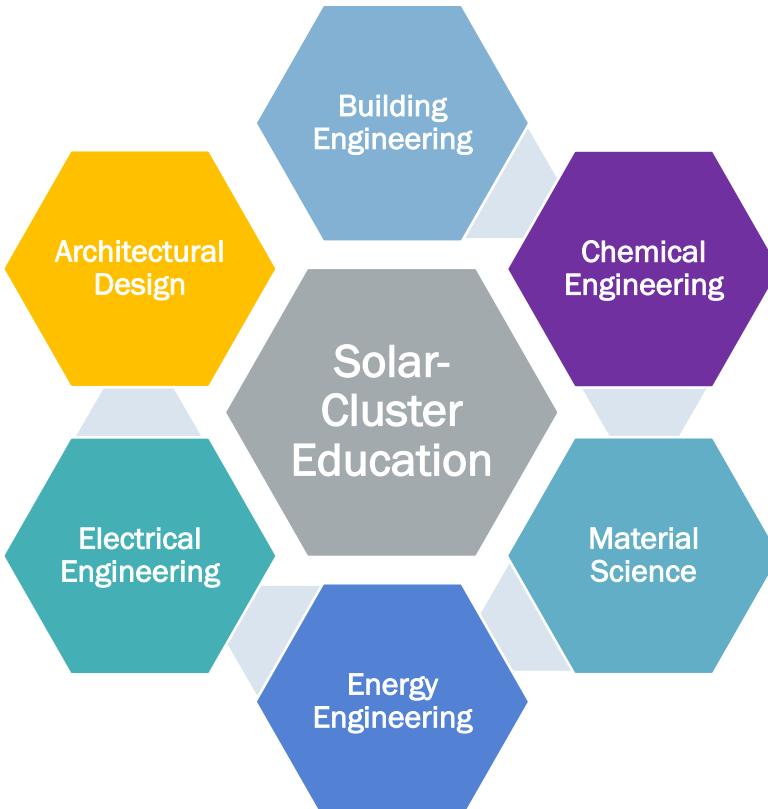
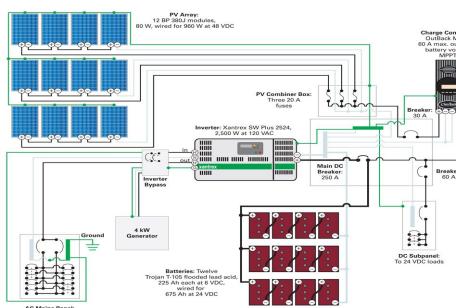
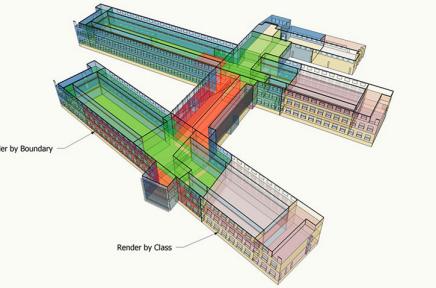


## Material Science



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# Solar and Building Environment

- Photovoltaic Applications in Emerging Energy Markets
- Solar Energy Building System Design
- Photovoltaic Systems Design and Construction
- Solar Engineering of Thermal Processes
- Solar & Windows – Heat and Light
- Commercial Solar Electric Systems
- Solar Project Development and Finance



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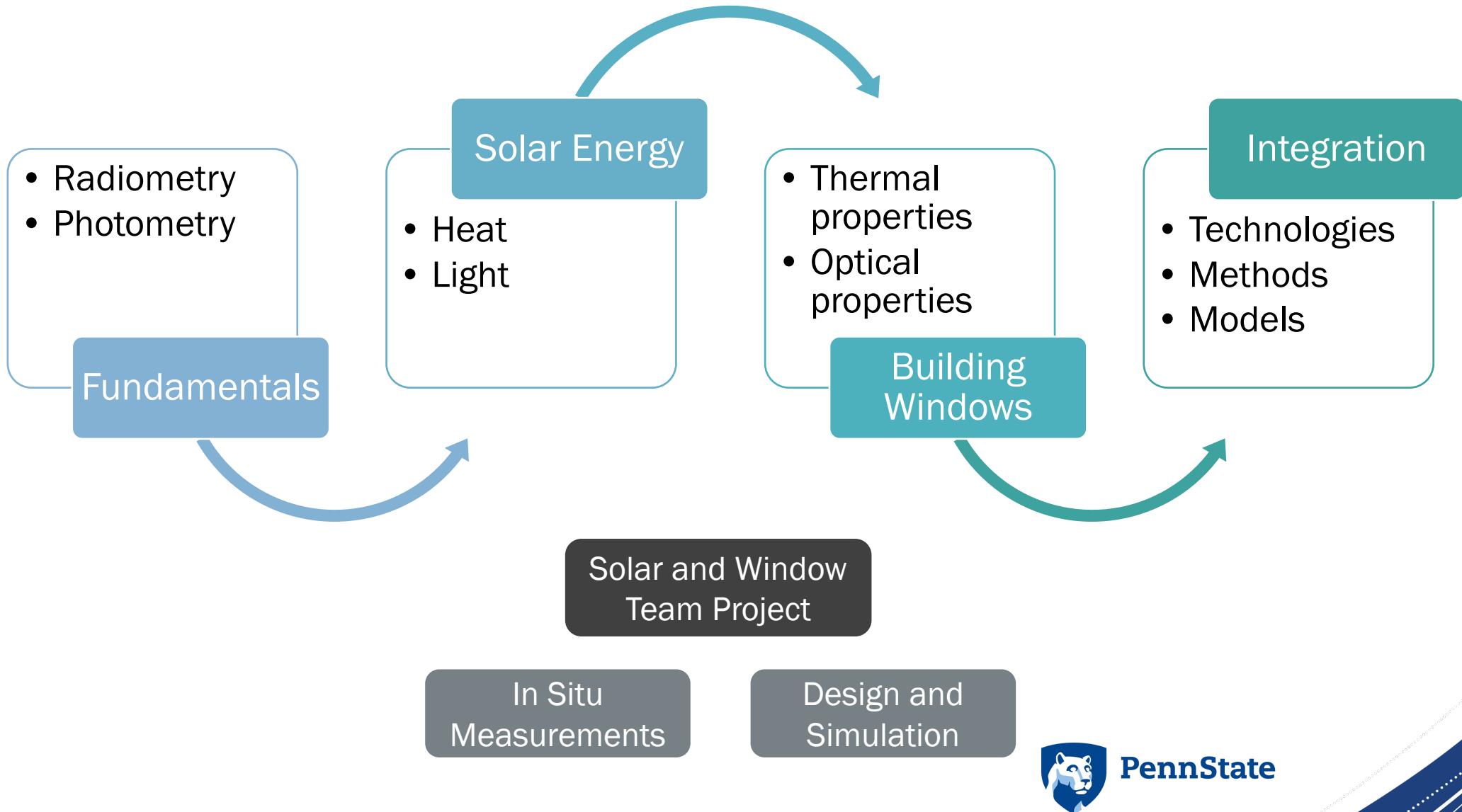
# Solar & Windows – Heat and Light

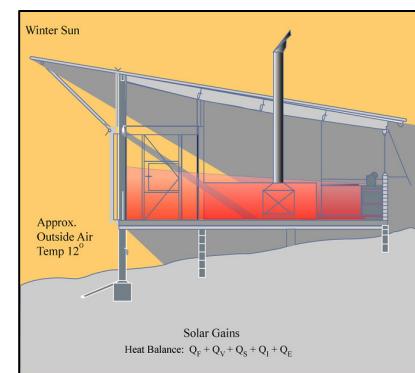
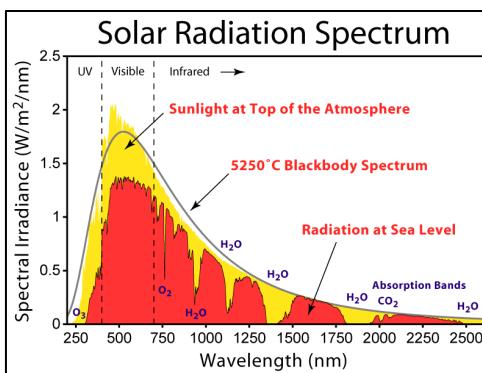
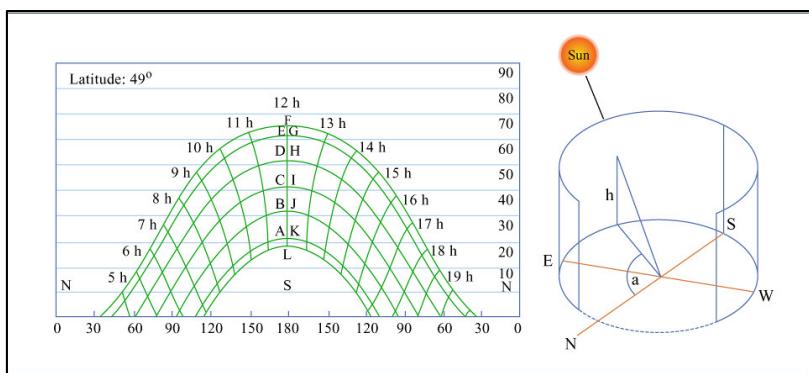
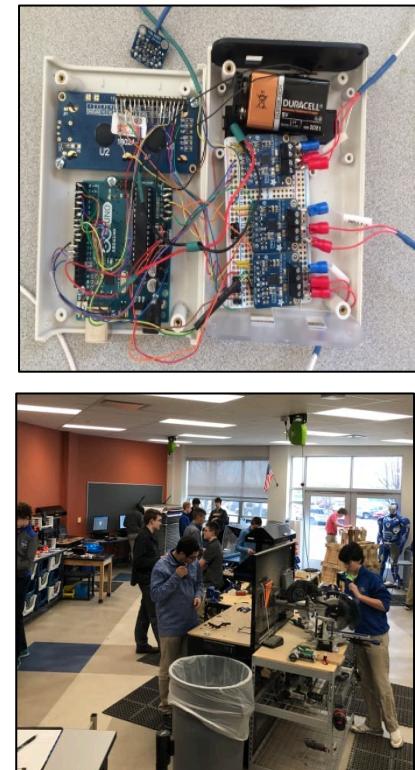
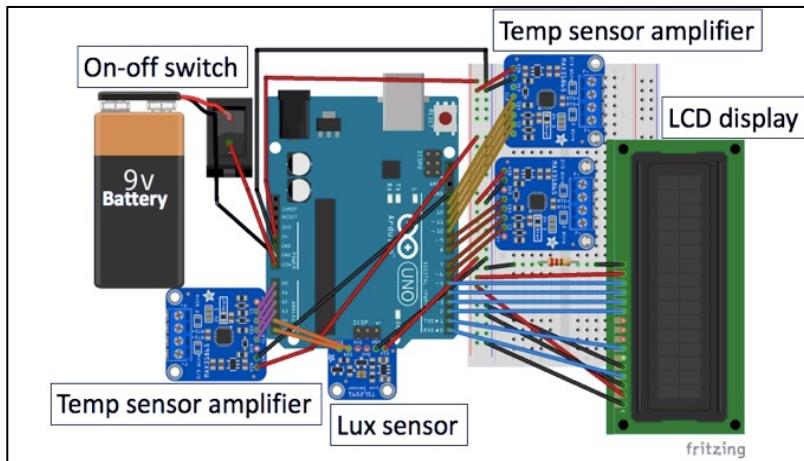
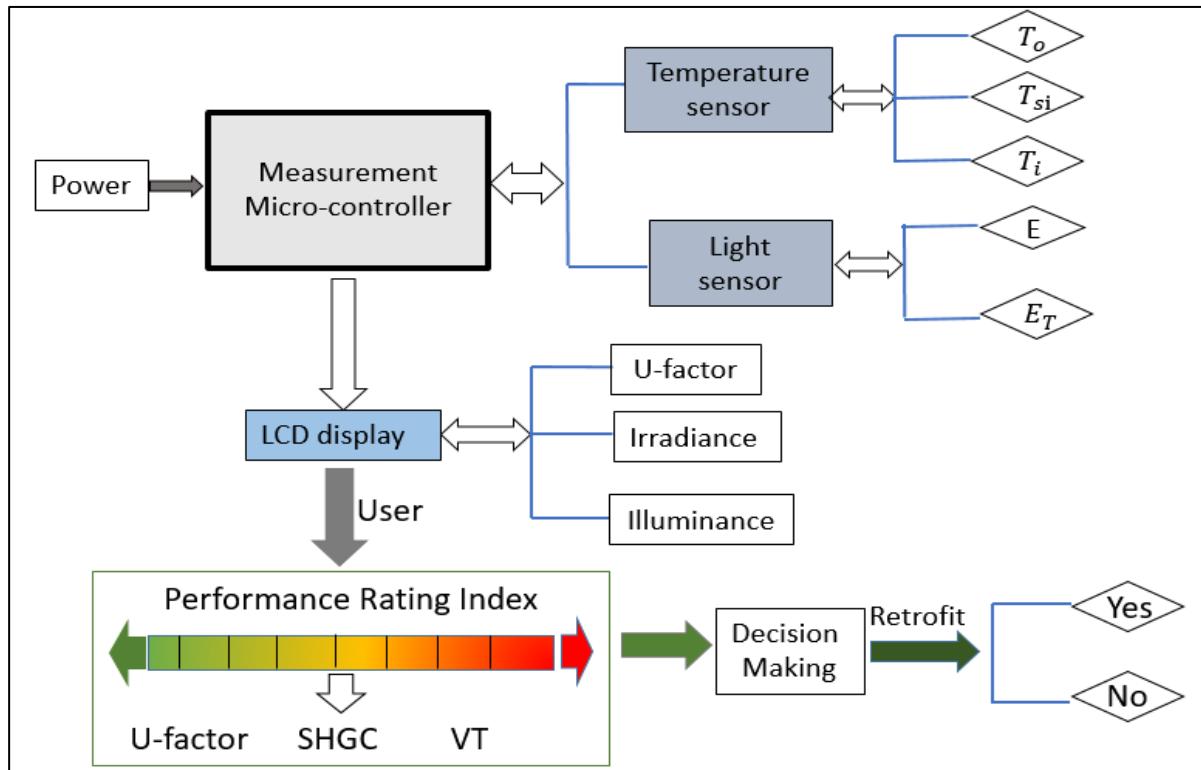


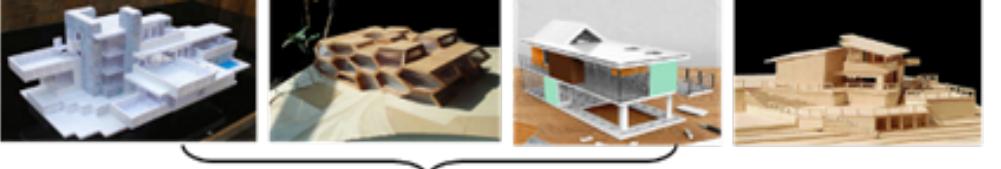
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# Solar & Windows – Heat and Light

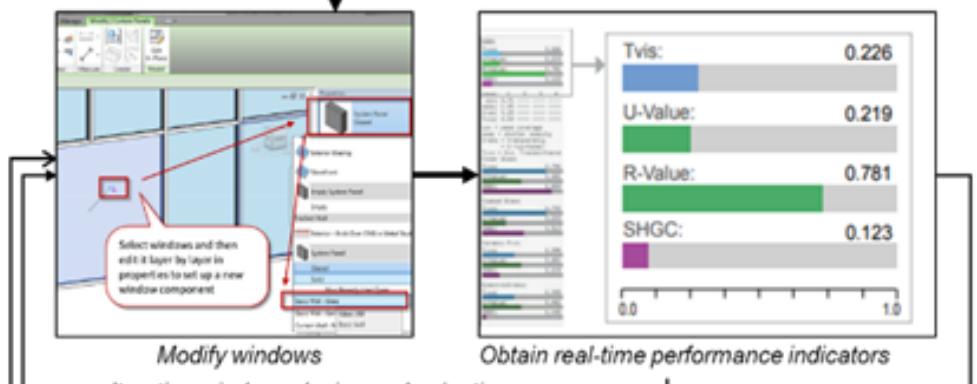






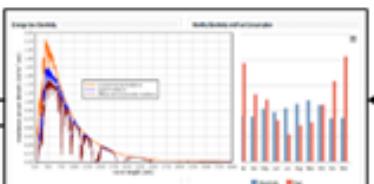
One model selected as the baseline model for Phase II

### Phase I: Communication and collaboration for sustainable design improvements

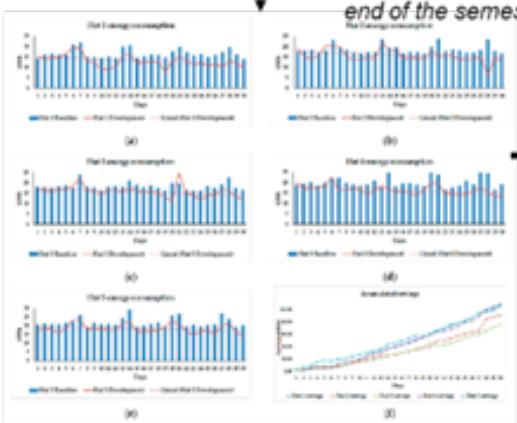


Redesign the windows everyday upon reported the energy use and solar irradiance data

Total energy use till the end of the semester



Daily energy use calculation



### Phase II: Collaborative competition process for the goal of minimum energy use

Semester-long “game” addressing solar energy utilization and window design



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# Thank You

