Development and Validation of Smart Building Technology Modules for Academic and Professional Education

DID YOU KNOW?

DOE funding allows the team to collaborate, strategize, develop, and validate the innovative curriculum that fills the competency gaps in traditional architectural engineering programs and for other building technology professionals.

OBJECTIVES

DEVELOP AND VALIDATE a set of module-based, course materials ready to be adopted by college professors in scalable smart building technologies.

DEVELOP online training videos suitable for building professionals' continuing education.

DISSEMINATE project information and resource to target audiences.

SUMMARY OF THE PROJECT

Slipstream leads a team developing a semester-long smart building curriculum for college students and adapting the contents into 16 training videos for building professionals and the public. The topics cover smart building technologies related content including industry trends and benefits, building systems, sensors and IoT devices, advanced building monitoring and controls, smart building control platform, methods, and applications.

MAJOR CONCLUSIONS

The training materials will be available for free by the end of 2024. The project will bridge a gap in systematically learning smart building technologies. The team believes the best practices in developing curriculum or training content are:

1) Involving project advisors early to review training outlines including topics covered;

2) Going through multiple rounds of internal and external technical expert reviews, if possible;

3) Collaborating with learning management system provider to structure the training course for effective learning and testing.
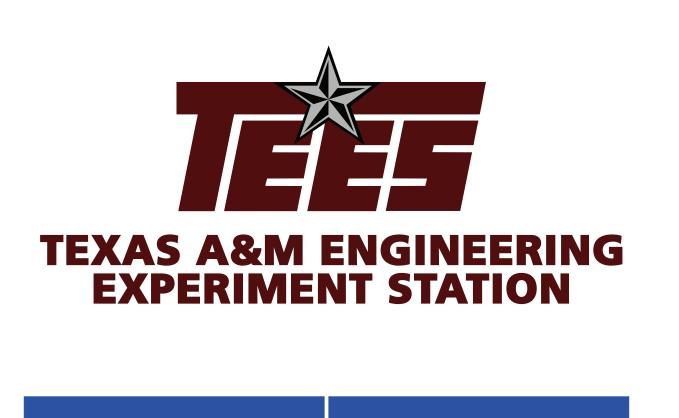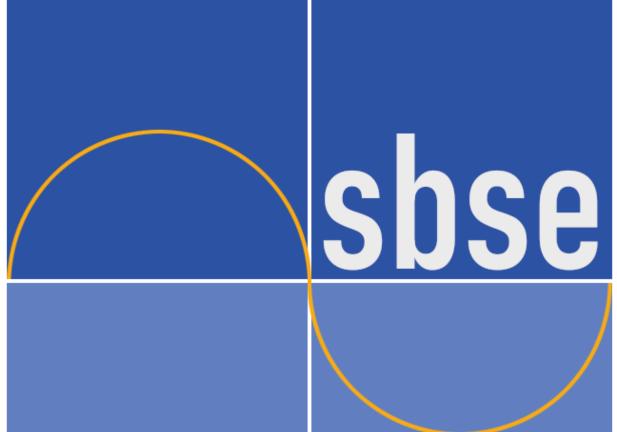
PRESENTER

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Slipstream

Slipstream is a nonprofit that discovers, tests, and scales climate solutions in buildings and communities.

COURSE MODULES FOR COLLEGE EDUCATION

MODULE #	MODULE TITLE
0	Introduction of the Course
1	Fundamentals of Building Mechanical and Energy Systems, and Building System Integration
2	Smart Building Technologies Drivers and Trends
3	Fundamentals of Smart Building Technologies
4	Advanced in Building Energy Management and Controls
5	Applications of Engineering Tools and Standards—Building Operation
6	Smart Building Technologies Case Studies for Design and Operation
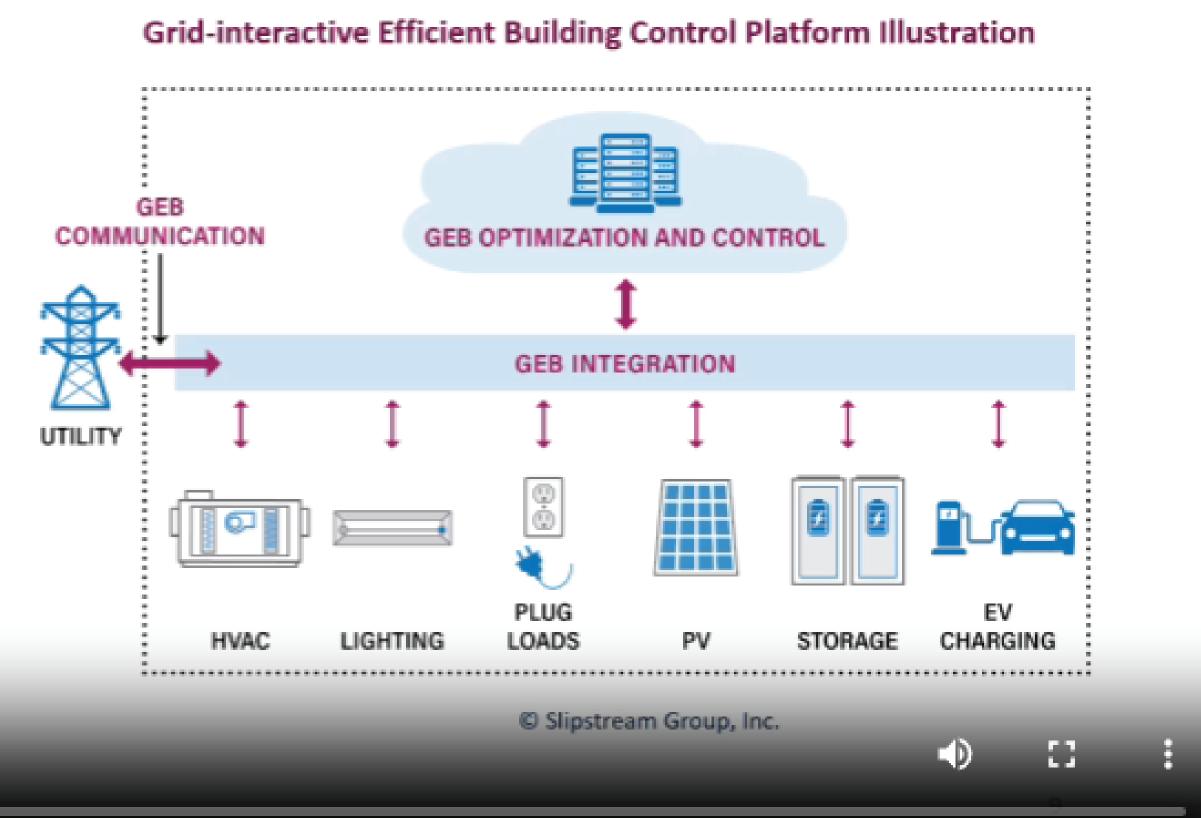
ONLINE TRAINING VIDEOS FOR BUILDING PROFESSIONALS

SESSION #	TOPIC CATEGORY	TOPIC
1	Introduction	Introduction to Smart Building Technologies
2	Building Systems	Building HVAC—Basic Systems
3		Building HVAC—Complex Systems
4		Networked Lighting Controls and HVAC Integration
5		Solar PV, BESS, and EV Charging
6		Smart Window, Automated Shades, Phase Change Materials, and Plug Loads
7	Sensors and IOT Devices	Sensors
8		IOT Devices
9	Smart Building Controls	Advanced Building Monitoring and Controls
10		Smart Building Control Platform
11		Smart Building Control Platform Cybersecurity
12		Smart Building Control Methods
13		Occupant-centric Control
14	Smart Building Applications	Grid-interactive Efficient Buildings and Connected Communities
15		Review of Whole-building Simulation Programs
16		Smart Building Application Examples