

# Development of Learning Modules for EDSGN 100 to Develop World-Class Engineers

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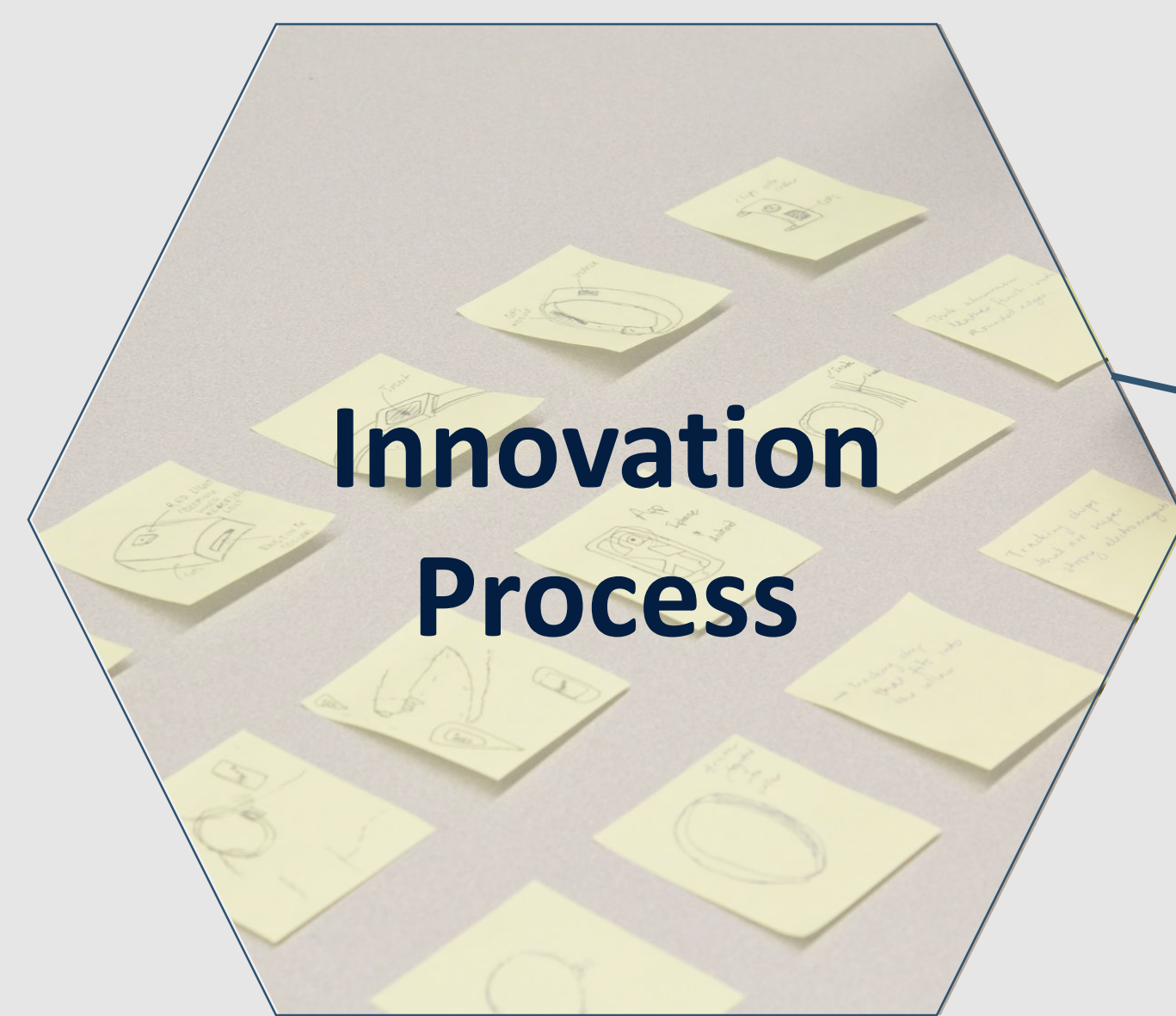
ENGINEERING  
 DESIGN

## Motivation:

The goal of this project was to provide students a consistent foundation across all sections of EDSGN 100 through the development of six multidisciplinary modules. EDSGN 100 is the cornerstone design course for nearly 3600, primarily first-year, students at Penn State each year. In addition to reinforcing the breadth of the College and aligning with College objectives, these modules support updated course goals for EDSGN 100. Through a framework of World-Class Engineering, these modules reinforce the attributes of, and assist our students in identifying as, world-class engineers.

## Process:

Twenty-one faculty members from six Penn State campuses contributed to the development and revision of the six modules. Following a pilot, the modules were revised based on realistic constraints and feedback from EDSGN 100 faculty. Subsequently, the module materials were uploaded to a shared Canvas site for easy incorporation into classes.



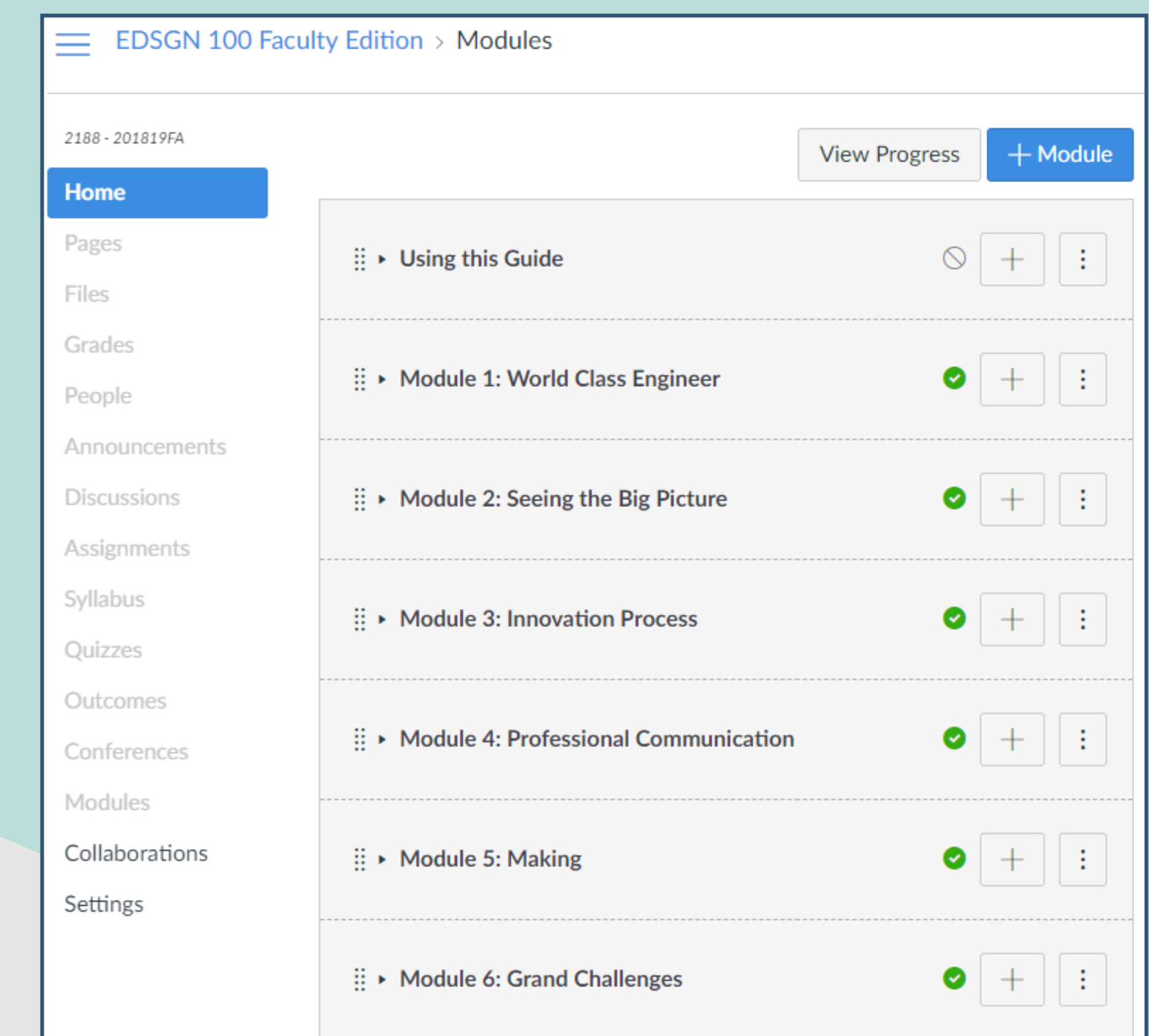
**Innovation  
 Process**

Concept Generation  
 Concept Selection  
 Prototyping

## World Class Engineering Attributes:

Solidly Grounded  
 Technically Broad  
 Globally Engaged  
 Ethical

Innovative  
 Excellent  
 Collaborators  
 Visionary Leaders



**Communication**

Sketching  
 CAD  
 Formal & informal  
 Presentations

Access to Clean Water  
 Solar Energy  
 Personalized Learning



**Grand  
 Challenges**



**Big Picture  
 Thinking**

Systems Thinking  
 Sustainability

Physical Prototypes  
 CAD Models  
 3D Printed Artifacts



**Making**

Teamwork  
 Leadership  
 Ethics



**World Class  
 Engineering**

## EDSGN 100 Course Goals:

- Apply engineering design process
- Use systems thinking
- Develop professional skills
- Communicate concepts and designs
- Gain hands-on experience

## Key Takeaways:

- Faculty have developed interactive, hands-on modules that engage students in the classroom and align with course goals.
- Work is ongoing to more seamlessly integrate the module content into engineering design projects, providing a more cohesive student experience.