Development of Criteria for Excellence in Building Science Curricula

The criteria will address the following areas:

- building science curricula (both residential & commercial);
- key courses and teaching methodologies, and
- requirements for acquired knowledge, skills and abilities (KSA's).

The initial focus of the criteria is university level courses. A matrix of curricula is being developed against different disciplines supporting the design/construction industry:

- Engineering and Technology (e.g., Mechanical, Civil, Architectural; Material Science);
- Architecture (skilled in building performance);
- Construction Management; and
- Other (Building Physics (EU)).

The Criteria might include:

- Education that supports the expansion of a certified, professional workforce that routinely designs and builds quality, high performance buildings that are healthy, safe, durable, comfortable, and energy efficient.
- Curriculum that addresses both *specialized courses* in building science and building performance along with *standard courses* which integrate advances in building science and quality management, e.g., construction management, construction documentation, etc.
- Technical basis for the curriculum is traceable to currently accepted, peer-reviewed research.
- Possible recommended curricula should address:
  - Building science for building enclosures
    - Optimization across various building performance parameters, including trade-offs for fire, moisture, constructability, strength, cost, etc.
    - Hygrothermal analysis (heat and mass transfer) for building enclosures
    - Characterization and performance of building materials, components, and assemblies, and their interactions with each other and the whole building system, including material compatibility
  - HVAC system performance
    - Whole building mechanical system analysis (including loads, flows, and pressures)
    - Advanced ventilation
    - Fundamentals of indoor environmental quality, including pollutant sources
    - Heating and cooling load analysis (ASRHAE, ACCA, etc.)
    - Installed performance of equipment and systems (dehumidification performance, part load efficiency, diagnostics and sensors, etc.)
  - Construction Management
    - Critical path analysis and process control
    - Advanced quality management principles (see ToolBase, etc.)
  - Design/Construction Documentation (advanced detailing, quality scopes of work, etc.)
  - Design Process (Integrated Design Process, Codes & Beyond Codes, etc.)
  - Building Performance Analysis and Documentation
    - Building Analysis and Optimization
    - Diagnostics and testing
    - Commissioning (Total Building including enclosure, MEP (mechanical, electrical & plumbing) systems, acoustics, fire and life safety, and structural systems)
  - Systems Engineering