

COA 8690 CE

Building Product Models: Interoperability for Design & Engineering

CRN30586

Prof. Charles Eastman

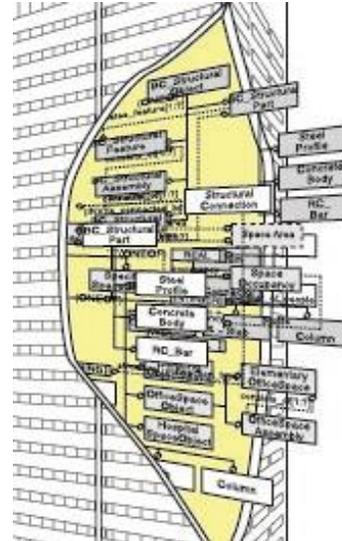
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Time: Tues,Thurs. 8:30 – 10:00am

Location <TBD>.

Course Description:

Building product model is the name given to a public standard digital representation of a building for use throughout the design, engineering, construction, operation lifecycle. Building Product Models are used in data exchange between building applications and also to provide server structures for managing all project data throughout the building and project lifecycle. It is easily viewed and queried. What is the extent of building model data, starting in sketches and progressing through to fabrication-level detailing, or to facility management and historical preservation? Building semantics address both the current pragmatic aspects of data modeling such as varying levels of shape and geometry, engineering performance input and output, to also include spatial and material quality and building quality.



This course primarily focuses on the structure, semantics and the uses of the Industry Foundation Class (IFC), the main standard public representation of buildings, also called ISO 16739. Also ISO-STEP and manufacturing product models

After an introduction of the need for product model exchange and its uses, the course surveys in detail current product modeling technology. It focuses on IFC and its various incarnations, for client-to-client and server-based exchanges. It reviews in some depth the semantic variation that challenges product models for specific areas of building and fabrication. These will include, steel, concrete structures and building skins, and spaces for different functions. New methods for developing task-specific workflow definitions, using what are called Model View Definitions will be reviewed in detail, as well as methods of modularizing and generalizing exchange modules, using concepts and *Semantic Exchange Modules*. The development of model views and the modularization of building models leads to issues of building semantics, addressing how the universe of design knowledge can be expanded. This knowledge will then be applied to rule checking. Students will learn to apply rule checking to aspects in building design that are important for building code compliance. Course will identify critical needs of the well-defined building model using IFC and apply appropriate problem solving logic to design an automatic checking of building codes to the building model.

The course prepares research minded students to develop and/or apply integration technologies in their design and IT research, or to use IFC building models as the basis for new applications or development work. The course also prepares IT literate design professionals and managers to deal with the crucial issues concerning data exchange and information flow in design teams and across the WWW.

Students are expected to have some knowledge with programming and/or scripting, but not necessarily be programmers, in that it is more important to apply the programming logic to solve problems than the actual program. Most reading will be from the Web. The course involves a series of projects in product model view definition, and doing studies in augmenting the processes within design and construction through the integration of various existing or new tools.