

*ABET Course Syllabus***Course Information, Textbook and Supplementary Materials**

Course Description: Building Information Modeling, current BIM technologies; coordination of design and construction; information management throughout building lifecycle; project delivery systems and technologies for integrated practice. This course focuses on the role of BIM in the AEC (architecture, engineering and construction) industry and it covers recent developments in the area of BIM. Students will learn about BIM, its use in the AEC industry, examine geometry, special relationships, geometric information, properties of building components, and understand the benefit and improvement areas BIM process offers as the impetus for the paradigm shift in building design, construction and management. In addition, the course brings cutting edge and emerging technology solutions into the classroom and tries to link these solutions into the BIM environment.

Elective: BSCE Construction Track; Minor in Construction Planning and Management

Prerequisite: Senior or Graduate standing **Co-Requisite:** None

Required Textbooks:

- 1) BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors- Chuck Eastman, Paul Teicholz, Rafael Sacks, Kathleen Liston, 2nd Edition

References:

- 1) Building Smart Alliance - <http://www.buildingsmartalliance.org/>
- 2) National BIM Standard (NIBS) - <http://www.nationalbimstandard.org>
- 3) Analysis, Research and Reviews of AEC Technology - AECbytes - <http://www.aecbytes.com/>

Topics Covered	Learning Outcomes
Building Information Management	What is BIM and what is NOT BIM? Why is BIM important? How BIM is changing the AEC industry? Uses of BIM
BIM tools	Different software environments, and solutions (pros and cons) Interoperability issues Advantages of and challenges with BIM technology
BIM for owners, architects, and engineers and contractors	Uses of BIM by architects, engineering, contractors Use of BIM in facilities management (the owner's perspective)
Future trends in BIM and technology	Innovative uses of BIM and AEC technology (examples include: virtual environments, cloud based BIM, laser scanning and BIM, 3D printing, etc)

Topics Covered	Learning Outcomes
BIM authoring	Building elements (walls, doors, windows, floors, roofs, etc.) Circulation (stairs, etc.) Documentation (sections, elevations, 3D views) Structural modeling with BIM Creating schedules and quantities LOD (level of detail)
BIM based collaboration	How to collaborate in a BIM environment Team work in a BIM environment Sharing/linking models Opportunities and challenges

CE 470

Building Information Management (BIM)

3 Units

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Topics Covered	Learning Outcomes
Interference and rule checking with BIM	Model integration Interference checking Rule checking Information take off Identifying/resolving issues
4D simulation with BIM	Creating a 4D simulation Time based clashes: identification and resolution

Lecture and Lab Schedule			
Lecture		Lab	
Sessions per Week	Duration per Session	Sessions per Week	Duration per Session
1	3 hours	8 in-class sessions per semester	3 hours

Relation of Course Objectives to Program Outcomes	Course Contribution to Program Outcomes (a-k)	✓ Key
	<p>The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.</p> <p>This course contributes to the program outcomes as outlined in the adjacent table.</p>	d. An ability to function on multi-disciplinary teams.
f. An understanding of professional and ethical responsibility.		
h. The broad education necessary to understand the impact of engineering solutions in a global economic and environmental and societal context.		
i. Recognition of the need for, and an ability to engage in life-long learning.		
j. Knowledge of contemporary issues.		

k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	✓
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