

**PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS**

**FUNDAMENTALS OF BUILDING INFORMATION MODELING
CET 2080**

Class Hours: 3.0

Credit Hours: 3.0

Laboratory Hours: 3.0

Revised: Spring 2014

Catalog Course Description:

This course will allow users to gain a solid foundation of Building Information Modeling (BIM) and its benefits via Revit Architecture and covers fundamental techniques, planning, drawing details, using drafting views and working with elements, components and families. Students will work with construction documents and the proper workflow while completing architectural projects that range in scale from designing a single space to an entire site.

Entry Level Standards:

College-level reading, writing, and math skills. Basic AutoCAD skills.

Prerequisites:

CET 1100 or consent of instructor

Corequisites:

ENGL 1010

Textbook(s) and Other Course Materials:

Mastering Autodesk Revit Architecture 2013
<http://www.amazon.com/Mastering-Autodesk-Revit-Architecture-2013/dp/1118174089>

I. Week/Unit/Topic Basis:

Week	Topic
1	Lecture: Introduction to Building Information Modeling Lab: BIM environment
2	Lecture: Modeling Building Elements Lab: Building Elements assignment
3	Lecture: Building Envelope Lab: Building Envelope assignment
4	Lecture: Curtain Systems Lab: Curtain systems assignment
5	Lecture: Interiors and Circulation

- Lab: Interiors and Circulation assignment
- 6 Lecture: Fixtures and Fittings
Lab: Fixtures and Fittings assignment
- 7 Lecture: Views and Visualization
Lab: EXAM 1 - BIM Environment
- 8 Lecture: Materials, Lighting and Rendering
Lab: Materials, Lighting and Rendering assignment
- 9 Lecture: Area and Space Planning
Lab: Area and Space Planning assignment
- 10 Lecture: Project Phases and Phased Design
Lab: Project Phases and Phased Design assignment
- 11 Lecture: Design Options
Lab: Design Options assignment
- 12 Lecture: Detailed Design / Construction Documents
Lab: Begin Final Project
- 13 Lecture: Detailed Design / Schedules and Quantities
Lab: Continue Final Project
- 14 Lecture: Finish Final Project
Lab: Finish Final Project
- 15 Final Exam Problem

II. Engineering Technology General Outcomes (Educational objectives)

- I. Apply basic engineering theories and concepts creatively to analyze and solve technical problems
- II. Utilize with a high degree of knowledge and skill equipment, instruments, software, and technical reference materials currently used in industry.
- III. Communicate effectively using developed writing, speaking, and graphics skills.
- IV. Assimilate and practice the concepts and principles of working in a team environment.
- V. Obtain employment within the discipline or matriculate to a four year program in engineering or industrial technology

III. Engineering Technology Concentration Competencies*

Students will:

- A. Apply the knowledge, techniques, skills, and modern tools for the concentration of study to specifically defined engineering technology activities
- B. Demonstrate the knowledge of mathematics, science, engineering and technology to engineering technology problems using developed practical knowledge
- C. Conduct and report the results of standard tests and measurements, and conduct, analyze

and interpret experiment or project results

- D. Function effectively as a member of a technical team
 - E. Identify, analyze and solve specifically defined engineering technology-based problems
 - F. Employ written, oral and visual communication in a technical environment
- At the program level all 6 competencies apply to roman numerals I – V of the Engineering Technology General Outcomes (Educational objectives) listed above.

IV. Course Goals*:

The course will

1. Introduce many basic techniques for creating building information models. (A,B, D, E)
2. Explore how to use BIM to integrate learned construction approaches and building systems to develop a comprehensive building model.(A, B, C, E, F)
3. Expand students understanding of digital expression and representation through BIM. (A,B, D,E,F)
4. Introduce students to BIM project development process . (A, D,E)

*Capital letters after course goals reference the competencies of the Engineering Technology concentrations listed above.

V. Expected Student Learning Outcomes*:

Students will be able to:

- a. Move around confidently within the BIM environment. (1, 2, 3, 4)
- b. Use existing families and create new ones. (1, 2, 4)
- c. Design and modify building envelope and curtain wall systems. (1, 2, 3, 4)
- d. Use BIM design options tools to create shape volumes that respond to design assignments and Create multiple design option variations using design options tool. (1, 2, 3, 4)
- e. Create details, views and schedules. (1, 2, 3, 4)
- f. Effectively render a BIM model.(1, 2, 3, 4)
- g. Create design options to consider and evaluate alternative design strategies. (1, 2, 3, 4)
- h. Cover file management, Environment settings, file templates, etc. (1, 2, 3, 4)
- i. Introduce techniques for creating and adapting components to model fixtures, fittings, and furniture. (1, 2, 3, 4)
- j. Explore the tools available to create several types of common project views and specify the information that appears in them. (1, 2, 3, 4)
- k. Explore how to adjust the appearance of the building model elements that appear in their 2D and 3D views. (1, 2, 3)

1. Add details and annotations to model views to create detail views that can be used in construction documents. (1, 2, 4)

*Numbers after Expected Student Learning Outcomes reference the course goals listed above.

VI. Evaluation:

A. Testing Procedures: 15% of grade

There will be two True/False, Multiple Choice, and Design Vignette Exams - no make-ups

B. Laboratory Expectations: 80% of grade

Quizzes:

Quizzes may be given by the instructor. Most quizzes will be un-scheduled and randomly given. They cover the previous session's materials or the reading assignment for that day. There is no make-up or extra credit given for quizzes missed.

Design work:

There will be multiple individual student design assignments to be completed as indicated on this syllabus. All assignments must be handed in on time and in the form provided by your instructor.

All assignments will be assessed a 10% penalty for each school day it is late.

All student work submitted for evaluation may be retained by the instructor.

Homework:

Students may also be required to hand in answers to select questions at the end of each chapter or other appropriate homework at the instructor's discretion. All written assignments must be handed in on 8 1/2 x 11" engineering notepad paper, paper with smooth edges, or forms provided by your instructor.

All written assignments will be assessed a 10% penalty for each school day it is late.

All student work submitted for evaluation may be retained by the instructor.

C. Field Work:

n/a

D. Other Evaluation Methods: 5% of grade

A subjective evaluation based on attendance, classroom participation and attitude may be included.

E. Grading Scale:

Grades are based on the following:

90 - 100 A
85 - 89 B+
80 - 84 B
75 - 79 C+
70 - 74 C
60 - 69 D
Below 60 F

VII. Policies:

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one's own work.
- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

C. Accommodations for disabilities:

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by sending email to disabilityservices@pstcc.edu, or visiting Goins 127, 132, 134, 135, 131. More information is available at <http://www.pstcc.edu/sswd/>.

D. Other Policies:

Safety and Equipment Abuse:

Repeated safety violations will result in a reduction of final grade, at the instructor's discretion. Flagrant violations which result in equipment damage or personal injury could result in automatic failure of the course