

# EVDS Course Outline - Draft

Building Information Modeling

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EVDS 683.01 Q

## Introduction

This course explores the Building Information Model (BIM) as a both form and process involving generation and management of digital virtual representation(s) of a building design. The resulting building information model becomes a shared resource to support decision-making about a building design from earliest conceptual stages, through design development, analysis, fabrication and construction. The BIM itself can carry through into its operational life. BIM is introduced as an enabling technological platform integrated project delivery.

BIM encourages all professionals, firms and organizations in a construction project work cooperatively to create better buildings, faster delivery times, lower costs, reduced scope for or no litigation. This can form the basis of a more effective process for the entire team

## Objectives

Students will learn about the essential concepts and methods associated with executing BIM projects, the various ways in which BIM has been used currently in the building industry, and its broader implications for the profession. In addition, students will acquire practical skills in using Revit (and related tools), software made by Autodesk, which is widely used in the industry today. Although we are focusing on the AutoDESK platforms, the underlying concepts are applicable to BIM projects regardless of platform.

We will look closely at the transformation from a Design Conceptual model, to a Constructible building design and explore the variety of means, using REVIT tools and methods, such as parametric and adaptive components to achieve complete designs. We will explore the opportunities for Data connectivity for better decision making.

1. *Understand REVIT Concepts relating to BIM Projects.*
2. *Convert an existing Design project to REVIT LOD 300 Model*
3. *Understand Data relationship to BIM Projects*
4. *Gain an appreciation of Practice concepts of building construction and analysis.*
5. *Understand basic 3D coordination concepts using Navisworks..*
6. *Introductory understanding of selected International Technical Standards*

## Teaching Approach

The course will have both the seminar and the workshop/LAB format with supporting WEB Training from Global E Training. Monday class meetings will be devoted mostly to lectures or discussions of assigned readings; there will be a number of guest lectures in the second half of the term by leading professionals in the industry. In general, Wednesday meetings will consist of LAB Time, demonstrations of essential concepts and modeling techniques in Revit and other software, which is freely available to students through Autodesk's website. During the course students will develop an enhanced BIM (i.e. Geometry plus Data information) of either their own studio project from the Comprehensive Design Studio or a project provided by the instructor.

The Developed BIM will be used for Technical analysis using Navisworks. Strategies in 3D coordination will be explored and several test conditions will be resolved using appropriate work flow.

Each student will present the BIM project in the last week of the class. In addition, each student will submit a short, two-page paper (1,000 words) addressing, in critical fashion a BIM-related issue that should emerge out of seminar discussions. This paper may be selected for a published document pending student's selection and approval for use.

## Content: Topic Areas & Detailed Class Schedule

Monday – Lab , Wednesday – Lecture

### JANUARY

- 1/12 Introduction to BIM / Getting Started
- 1/14 Creative BIM (Branko Kolarevic)
- 1/19 BIM Concepts and Methods
- 1/21 Model Organization Strategy
- 1/26 Parametric Concepts
- 1/28 Advanced Concepts and Data

### FEBRUARY

- 2/2 Advanced Massing
- 2/4 Andy Hammer – Extending BIM Data (CODEBOOK)
- 2/9 Families
- 2/11 Adaptive Components
- 2/16 Reading Week
- 2/18 Reading Week
- 2/23 3D Coordination
- 2/25 Adaptive Components

### MARCH

- 3/2 Project consultations
- 3/4 Discussion of Families
- 3/9 Work-in progress presentations
- 3/11 Fabrication / Construction: Ellis Don
- 3/16 Project consultations
- 3/18 Guest Lecture: Bruce McCallam (TBC)
- 3/23 Project consultations
- 3/25 Project consultations
- 3/30 Project consultations

### APRIL

- 4/6 Project consultations
- 4/8 Final project presentations
- 4/13 Final project presentations

## Means of Evaluation

The final grade will be based on the following

|  |             |
|--|-------------|
| BIM project's development                    | (20%)       |
| Project outcome                              | (20%)       |
| Completion of GET REVIT Introduction         | (10%)       |
| Project presentation at the end of the term  | (20%)       |
| Two-page paper                               | (20%)       |
| Active participation in discussions and Labs | (10%).      |
| <b>Total</b>                                 | <b>100%</b> |

Note that this weighting may not be changed during the session or at the time of grade reporting.

Also note that as per FGS and U of C regulations, students shall have been informed by their instructors of the grades \*currently earned\* by one week before the withdrawal deadline in all courses.

## Grading Scale

| Grade | Grade Point Value | 4-Point Range | Percent  | Description   |
|-------|-------------------|---------------|----------|---|
| A+    | 4.00              | 4.00          | 95-100   | Outstanding - evaluated by instructor   |
| A     | 4.00              | 3.85-4.00     | 90-94.99 | Excellent - superior performance showing comprehensive understanding of the subject matter  |
| A-    | 3.70              | 3.50-3.84     | 85-89.99 | Very good performance   |
| B+    | 3.30              | 3.15-3.49     | 80-84.99 | Good performance  |
| B     | 3.00              | 2.85-3.14     | 75-79.99 | Satisfactory performance  |
| B-    | 2.70              | 2.50-2.84     | 70-74.99 | Minimum pass for students in the Faculty of Graduate Studies  |
| C+    | 2.30              | 2.15-2.49     | 65-69.99 | All final grades below B- are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements. |
| C     | 2.00              | 1.85-2.14     | 60-64.99 |   |
| C-    | 1.70              | 1.50-1.84     | 55-59.99 |   |
| D+    | 1.30              | 1.15-1.49     | 50-54.99 |   |
| D     | 1.00              | 0.50-1.14     | 45-49.99 |   |
| F     | 0.00              | 0-0.49        | 0-44.99  |   |

Notes:

- A student who receives a "C+" or lower in any one course will be required to withdraw regardless of their grade point average (GPA) unless the program recommends otherwise. If the program permits the student to retake a failed course, the second grade will replace the initial grade in the calculation of the GPA, and both grades will appear on the transcript.

## Readings

Required (and recommended) textbooks, readings, materials including electronic resources will be announced during the class.

New LOD Specification. - 2015

TBA

TBA

## Special Budgetary Requirements

### Mandatory:

Students will need to enroll in Global E Training. Cost is \$94.00. Enrollment must be complete before the second week of class. Assignments start Immediately.

|                            |                         |
|----------------------------|-------------------------|
| GLOBAL E Training          | \$94.00 / 1 Year Access |
| Introduction to REVIT      |                         |
| Advanced REVIT             |                         |
| Introduction to NAVISWORKS |                         |
| Student gets 2 others.     |                         |

**Notes:**

1. Written work, term assignments and other course related work may only be submitted by e-mail if prior permission to do so has been obtained from the course instructor. Submissions must come from an official University of Calgary (ucalgary) email account.
2. Academic Accommodations. Students who require an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to their Instructor or the designated contact person in EVDS, Jennifer Taillefer ([jtaillef@ucalgary.ca](mailto:jtaillef@ucalgary.ca)). Students who require an accommodation unrelated to their coursework or the requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience). For additional information on support services and accommodations for students with disabilities, visit [www.ucalgary.ca/access/](http://www.ucalgary.ca/access/)
3. Plagiarism - Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Most commonly plagiarism exists when:(a) the work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),(b) parts of the work are taken from another source without reference to the original author,(c) the whole work (e.g., an essay) is copied from another source, and/or,(d) a student submits or presents work in one course which has also been submitted in another course(although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved. While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence. It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by him or her in a thesis. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.
4. Information regarding the Freedom of Information and Protection of Privacy Act (<http://www.ucalgary.ca/secretariat/privacy>) and how this impacts the receipt and delivery of course material
5. Emergency Evacuation/Assembly Points (<http://www.ucalgary.ca/emergencyplan/assemblypoints>)
6. Safewalk information (<http://www.ucalgary.ca/security/safewalk>)
7. Contact Info for: Student Union (<http://www.su.ucalgary.ca/page/affordability-accessibility/contact>); Graduate Student representative( <http://www.ucalgary.ca/gsa/>) and Student Ombudsman's Office (<http://www.su.ucalgary.ca/page/quality-education/academic-services/student-rights>).