New York University Tandon School of Engineering  
Department of Civil and Urban Engineering  
Course Outline CE-U3Y3563LCLB Construction Modeling and Data Structures II  
SPRING 2018  
Professor Ashkan Rowshanrad  
Monday, Wednesday 05:30 pm – 07:20 pm; Jacobs Academic Building, Room 773

To contact professor: ar3425@nyu.edu  
Phone: 516-474-4322  
Office hours: by appointment

Course Pre-requisites: Construction Modeling and Data Structures I

Course Description
This course is an advanced course in construction management through building information modeling (BIM). The student will expand their understanding of construction assemblies, trade scheduling and estimating through initial studies of an existing project. Emphasis will be placed on the student's ability to illustrate and present the concepts being researched. This progressive approach incorporates the development of digital 3D models and their associated databases. Class expectations will build upon student’s ability to construction digital 3D models with MEP systems from 2D drawings (DWG/PDF) / 3D laser scan data (Point Cloud) and present them in intelligent construction documentation formats. Concepts of construction management and strategies for performing clash detection and scheduling associated with a project will be introduced.

Course Objectives
These indicate the most important knowledge, skills, attitudes/values, and abilities for a student to learn in a subject. The Foundational Objectives for this course curriculum include:

- Learn about BIM standards and BIM execution plans
- Ability to review and work with the 3D models including MEP systems
- Ability to work with point cloud and build 3D models on top of a point cloud
- Ability to define construction phases such as “Existing”, “Temporary” and “New Construction” into a 3D model
- Use and understand the terminology related to clash detection and perform clash detection and generate clash reports and coordinate to resolve the clashes
- Ability to produce construction simulations and 4D animations

Course Structure
The full lecture/lab allocation of 4 hours weekly should be accompanied by 4-6 hours of homework per week. Such homework would include 3D modeling for assigned projects, working with software platforms, field research, textbook reading and article reading (web or print). There is a final project for this course. There is no exam for this course.

Readings
Optional and recommended texts are:

- Up and Running with Autodesk Navisworks 2018, Deepak Maini
- Mastering Autodesk Revit Architecture 2018 / 2017 (Autodesk Official Training Guides)
- BIM and Construction Management, Proven Tools, Methods and Workflows, Brad Hardin
- Building Information Modeling, A strategic Implementation Guide for Architects, Engineers, Constructors and Real Estate Asset Managers, Dana K. Smith & M. Tardif
Course requirements
- USB flash drive or hard drive for daily work storage or equivalent online storage (Dropbox)
- Access to a personal use PC/Laptop (homework will require student software available for free from students.autodesk.com)
- Each student will research one or more real projects being undertaken with building information modeling. They will prepare a report representing the BIM Execution Plan (BEP) and work of the Architect, Engineer, Contractor and/or Fabricator, the applied software and methodology for the project(s) being researched. Students will provide a single sheet handout covering sources of information and main points of the presentation and will include explanation of BEP, visual examples of the team’s work and a PowerPoint presentation for the class. This will be 10% of final grade.
- Each student should fully participate in class activities and do the assigned projects. The class participation and homework (small projects) will be 50% of final grade.
- The Final Project will be 40% of final grade.

<table>
<thead>
<tr>
<th>Description of Class Content</th>
</tr>
</thead>
</table>
| **Week 1**  
Jan 22-24 | BIM Standards and BIM Execution Plan |
| **Week 2**  
Jan 29 - Jan 31 | 3D Laser Scanning and Point Cloud- Autodesk Recap |
| **Week 3**  
Feb 5-7 | Level of Development (LoD) |
| **Week 4**  
Feb 12-14 | Phasing and model management in Revit |
| **Week 5**  
Feb 21 | Navisworks 1: Intro to Navisworks - Selecting and Manipulating the Design |
| **Week 6**  
Feb 26 – Feb 28 | Navisworks 2: (4D-1) Importing project Schedule into Navisworks |
| **Week 7**  
Mar 5-7 | Navisworks 3: (4D-2) Creating Construction Simulations Using the TimeLiner Module |
| **Week 8**  
Mar 12-14 | Spring Recess, No class |
| **Week 9**  
Mar 19-21 | Navisworks 4: (4D-3) Working with the Animator and Scripter Modules |
| **Week 10**  
Mar 26-28 | Navisworks 5: (Clash Detection-1) Working with the Clash Detective Module |
| **Week 11**  
Apr 2-4 | Navisworks 6: (Clash Detection-2) Working with the Clash Detective Module |
| **Week 12**  
Apr 9-11 | Navisworks 7: (Clash Detection-3) Working with the Clash Detective Module |
| **Week 13**  
Apr 16-18 | Navisworks 8: Viewpoints, Animations, and Measurements |
| **Week 14**  
Apr 23-25 | Navisworks 9: Introduction to the Quantification Module |
| **Week 15**  
April 30 – May 2 | Trouble shooting |
| MAY 7 | Submitting final project |
Moses Center Statement of Disability

If you are a student with a disability who is requesting accommodations, please contact New York University’s Moses Center for Students with Disabilities (CSD) at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.

NYU School of Engineering Policies and Procedures on Academic Misconduct

A. Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Furthermore, those who breach the School’s rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School’s Policy on Academic Misconduct.

B. Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:

1. Cheating: intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person’s work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.

2. Fabrication: including but not limited to, falsifying experimental data and/or citations.

3. Plagiarism: intentionally or knowingly representing the words or ideas of another as one’s own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.

4. Unauthorized collaboration: working together on work that was meant to be done individually.

5. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.

6. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.