

COURSE SYLLABUS
The University of Texas at Arlington
College of Engineering
Department of Civil Engineering
CE 5301 & CM 5301 – Building Information Modeling
(3 Credit Hours)
Spring 2018

Name of Instructor: Dr. Mohsen Shahandashti, P.E.

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Faculty Profile: <https://www.uta.edu/profiles/mohsen-shahandashti>

Office Hours: Thursday: 1:00 – 5:00 PM – Additional Office Hours by Appointment.

Teaching Assistants: Bahram Abediniangerabi and Milad Nabaei, emails: bahram.abediniangerabi@mavs.uta.edu and milad.nabaei@mavs.uta.edu, Office Hours: Monday 10:00 AM– 1:00 PM, Civil Engineering Learning Center in NH 243

Course Number, Section Number, and Course Title:

CE 5301 – Building Information Modeling – Section 002
CE 5301 – Building Information Modeling – Section 021
CE 5301 – Building Information Modeling – Section 022
CM 5301 – Building Information Modeling – Section 002
CM 5301 – Building Information Modeling – Section 021
CM 5301 – Building Information Modeling – Section 022

Time and Place of Class Meetings:

CE 5301-002 and CM 5301-002: Thursday, 8:00 – 8:50 AM, NH 202
CE 5301-021 and CM 5301-021: Thursday, 9:00 AM – 11:50 AM, NH 235
CE 5301-022 and CM 5301-022: Thursday, 9:00 AM – 11:50 AM, NH 239

Description of Course Content: Introduction to Building Information Modeling (BIM); Discussions of the Roles and Impacts of BIM in the Design, Construction Engineering and Management, Infrastructure Engineering, and Facility Management; Revit Architecture, Structure, and MEP; Creating Sets, Building Elements, Structural Systems, and MEP Systems; BIM and Clash Detection; BIM and Construction Cost Estimating and Scheduling; Future of Building Information Modeling. Prerequisite: consent of instructor.

Student Learning Outcomes: Upon completion of the course, the student will have:

- an ability to apply knowledge of mathematics, science, and engineering
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- an ability to identify, formulate, and solve engineering problems
- an understanding of professional and ethical responsibility
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Requirements: consent of instructor.

Reference Books:

- Instructors' Lecture Materials, Notes and Handouts.
- Blackboard (course management)
- Eastman, C., Teicholz, P., Sacks, R., & Liston, C. (2011). BIM handbook: A guide to building information modeling for owners, managers, designers, engineers and contractors. John Wiley & Sons.
- Hardin, B., & McCool, D. (2015). BIM and construction management: proven tools, methods, and workflows. John Wiley & Sons.
- Krygiel, E., & Nies, B. (2008). Green BIM: successful sustainable design with building information modeling. John Wiley & Sons.
- Issa, R. R., & Olbina, S. (Eds.). (2015, May). Building Information Modeling: Applications and Practices. American Society of Civil Engineers.
- Teicholz, P. (Ed.). (2013). BIM for facility managers. John Wiley & Sons.
- Kymmell, W. (2007). Building Information Modeling: Planning and Managing Construction Projects with 4D CAD and Simulations (McGraw-Hill Construction Series). McGraw Hill Professional.
- Eynon, J. (2016). Construction Manager's BIM Handbook. John Wiley & Sons.
- Pittard, S., & Sell, P. (Eds.). (2016). BIM and Quantity Surveying. Routledge.
- Duell, R., Hathorn, T, and Hathorn, T.R. (2015), Autodesk Revit Architecture 2016 Essentials, Wiley and Sons, Inc.

Descriptions of major assignments and examinations with due dates: There will be two exams (one close to midterm, and one final which will be comprehensive), one project, quizzes, and several homework assignments. See Course Outline for specific dates.

Grading Policy: Grades will be determined according to the following scale (the grading scale may be lowered at the discretion of the instructor, but will not be raised):

Grade	% Required
A	90 -100
B	80-89
C	70-79
D	60-69
F	Less than 60

Students will be required to accumulate points from the following:

Homework	10%
Class Participation & Quizzes	10%
Midterm Exam (Lecture and Lab)	30%
Term-Project & Presentation	20%
Final Exam (Lecture and Lab)	30%
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Total	100%

Students must submit assignments on blackboard.

Late assignments will not be accepted.

Make-up Exam Policy: All students must take the exams. Only extenuating circumstances will be accepted as excuse for missing the exam. Health related excuses require **medical reports** and the **signature of a physician** that provided treatment.

Grade Grievance Policy: Refer to UTA Catalog for more information.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Attendance Policy: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I have established the following attendance policy: students are expected to attend all classes. For total professional development, class participation and oral discussions will be encouraged. Everyone is asked to arrive and be seated promptly for duration of class to minimize the disruption to others.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a **letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities (OSD), www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.

Title IX Policy: The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.

Academic Integrity: Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Student Support Services Available: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

The IDEAS Center (2nd Floor of Central Library) offers free tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email IDEAS@uta.edu or call (817) 272-6593.

Civil Engineering Librarian:

Martin Wallace, Engineering Librarian

Mailing address: Central Library, Office Number: 518. Phone: 817-272-3924, Email: martin.wallace@uta.edu

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Laptop use in the classroom: In order to minimize distraction, the use of laptop and/or any other digital device (except standard scientific calculators) in the classroom is NOT allowed.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

CE/CM 5301 – Building Information Modeling
TENTATIVE COURSE OUTLINE

Day	Date	Lecture Topic	Lab Topic	Assignments Due
Week 1				
Thursday	January 18	Introduction to the Course	Autodesk Revit Architecture Interface	
Week 2				
Thursday	January 25	Introduction to BIM	Revit / Walls and Curtain Walls	Assignment 1
Week 3				
Thursday	February 01	Software Tools	Revit / Floors, Roofs, and Ceilings	Assignment 2
Week 4				
Thursday	February 08	Term Project Description	Revit / Stairs, Ramps, and Railings	Assignment 3
Week 5				
Thursday	February 15	BIM and Project Delivery	Revit / Adding Families Revit / Modifying Families	Assignment 4
Week 6				
Thursday	February 22	BIM and Sustainability	Revit / Schematic Design Revit / Rooms and Color Fill Plans	Assignment 5
Week 7				
Thursday	March 01	BIM and Cost Estimating / 4D Simulation	Navisworks / Scheduling Navisworks / Clash Detection Revit / Estimating	Assignment 6
Week 8				
Thursday	March 08	Midterm Exam (Lecture)	Midterm Exam (Lab)	Assignment 7
Week 9				
Thursday	March 15	Spring Vacation		
Week 10				
Thursday	March 22	Legal Considerations	Revit / Materials, Visualization, Rendering Revit / Worksharing	
Week 11				
Thursday	March 29	BIM for Facility Management	Revit / Details and Annotations Revit / Drawing Sets	Assignment 8
Week 12				
Thursday	April 05	BIM and Infrastructure	Revit / Workflow and site modeling Revit / Repetition in Revit	Assignment 9
Week 13				
Thursday	April 12	BIM and Risk Management / Dispute Resolution	Revit / Structural Items	Assignment 10
Week 14				
Thursday	April 19	BIM-based Model Checking	Revit / MEP Items	Assignment 11
Week 15				
Thursday	April 26	The Future of Building Information Modeling	Project Presentations (CM5301)	Assignment 12 & Project

Day	Date	Lecture Topic	Lab Topic	Assignments Due
Week 16				
Thursday	May 03	Review and Class Survey	Project Presentations (CE5301)	
Week 17				
Thursday, 8:00 - 10:30 a.m., May 10		FINAL EXAM (Lecture and Lab)		

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Mohsen Shahandashti.

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911.