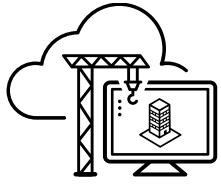


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# Teaching Preconstruction with BIM 360





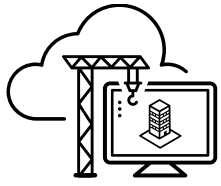
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## Teaching Preconstruction with BIM 360

### Wei Wu, Ph.D.

- Associate Professor, Chair
- Department of Construction Management
- California State University, Fresno





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# Agenda



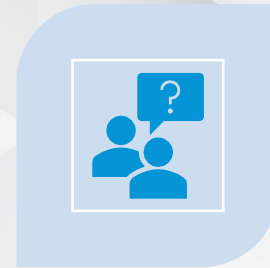
COURSE  
BACKGROUND



BIM 360  
EXPERIENCE



STUDENT  
FEEDBACK



Q & A



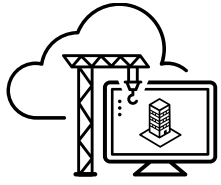
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# The Course: CM220 Advanced Planning and Preconstruction





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# Course Specifics

- Graduate course (~200 level)
  - 3-hour block, 15 sessions
  - Using Canvas LMS
- First MSCM cohort
  - 9 students enrolled
    - diverse backgrounds (age, gender, experience, field of study)
  - **Completely online**

CM220-01-36775-2213 · Modules

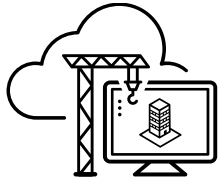
Spring 2021

Home  
Announcements  
Syllabus  
Attendance  
Modules  
Assignments  
Quizzes  
Discussions  
Chat  
Collaborations  
Outcomes  
Rubrics  
People  
Grades  
Course Ratings  
Google Drive  
New Analytics  
LockDown Browser  
Panopto Video  
Accessibility report  
Files  
Pages  
Conferences  
Ascorio Virtual Labs  
Follett Discover  
Follett ByteWave  
Settings

63 Student View

Collapse All View Progress Export Course Content

- Start Here
  - Welcome & Course Logistics
  - Autodesk Educational Account
  - Meet & Greet!
  - Ask the Instructor a Question!
- Learning Module 1 - Concepts & Framework
  - LM01 - Concepts & Framework
  - Additional Reading
  - SE01 - Preconstruction Services  
Feb 3 | 100 pts
  - Quiz 1 - LM01  
Feb 3 | 20 pts
- Learning Module 2 - Collaborate with Autodesk Construction Cloud
  - Introduce the Autodesk Construction Cloud
  - Preconstruction With BIM 360 - Executive Summary
- Learning Module 2.1 - BIM 360 Document Management
  - Document Management: Overview
  - Lecture 2.1.1 - Getting Started
    - Quiz 2.1.1  
10 pts
  - Lecture 2.1.2 - Project Team
    - Quiz 2.1.2  
10 pts
  - Lecture 2.1.3 - Manage Documents
    - Quiz 2.1.3  
10 pts
  - Lecture 2.1.4 - Review Documents
    - Quiz 2.1.4  
10 pts
  - SE02 - Top 3 Benefits of BIM for Preconstruction Services  
Feb 17 | 100 pts
  - Module 2.1 Document Management Project  
Multiple Due Dates | 100 pts
- Learning Module 2.2 - BIM 360 Model Coordination
  - Model Coordination: Overview
  - Lecture 2.2 - Identifying Clashes Between Coordinated Models
    - Quiz 2.2  
10 pts



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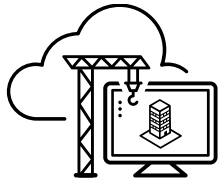
# Course Outline



- Learning Modules
  - LM 1 – Concepts & Framework
  - LM 2 – Collaborate with Autodesk Construction Cloud
    - LM 2.1 – BIM 360 Document Management
    - LM 2.2 – BIM 360 Model Coordination
    - LM 2.3 – Coordination & 4D Simulation with Navisworks Manage
    - LM 2.4 – Model-based QTO & Cost Estimate
- Integration Project
- Individual Research Paper

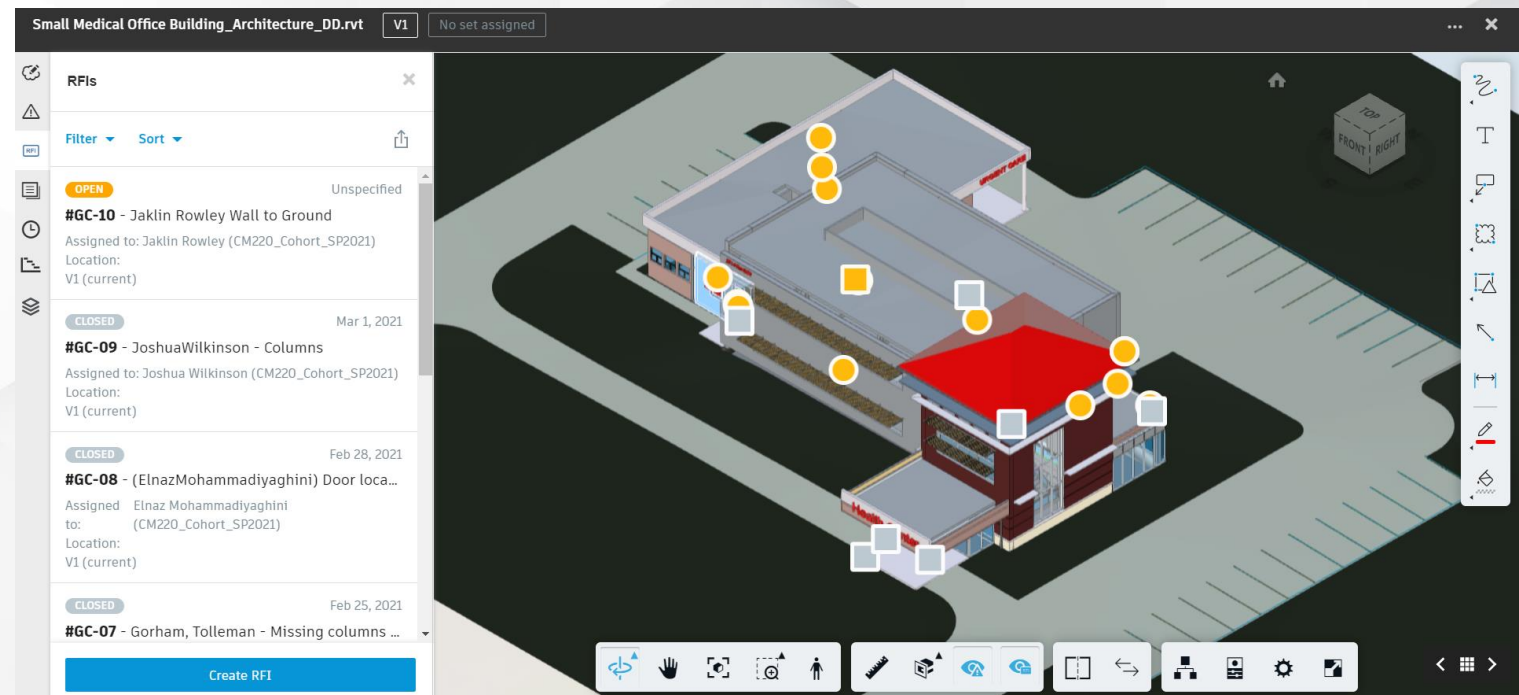
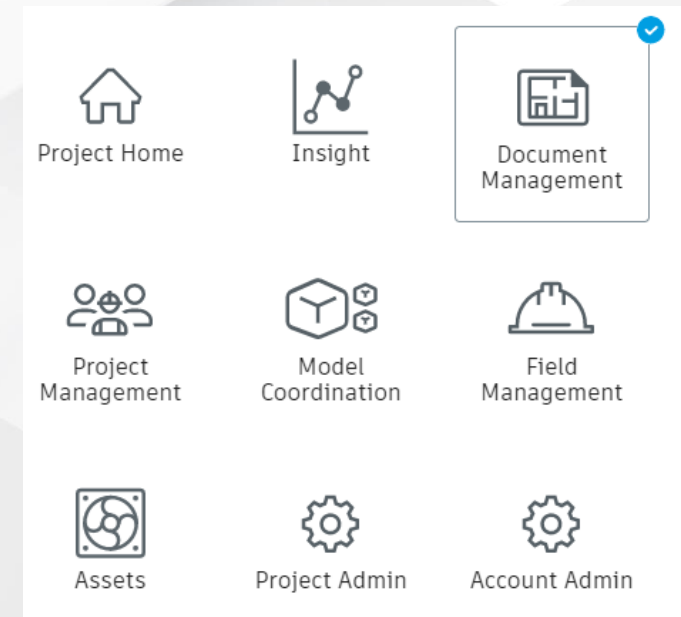
**Autodesk BIM 360  
Preconstruction  
Courseware**

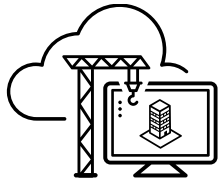




# Document Management

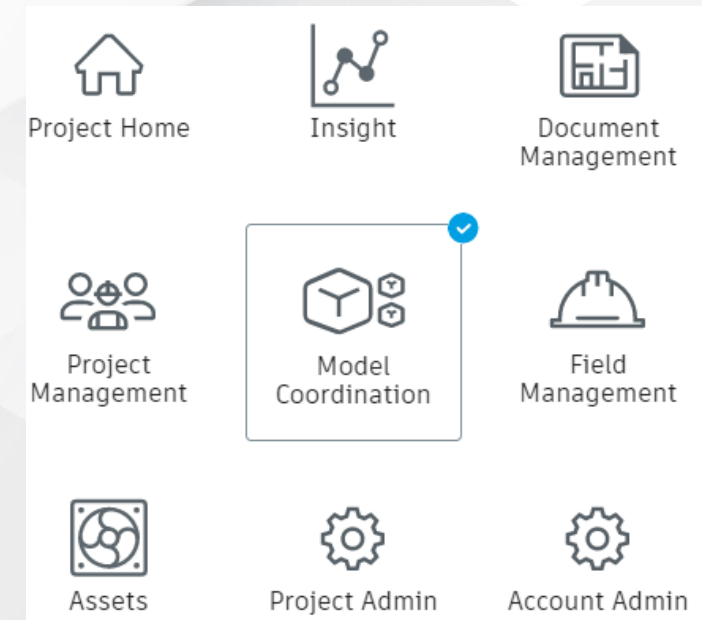
- Document upload, distribution, and version control
- Plans vs. Project Files
- Business processes
  - Markups
  - Issues
  - RFIs
  - Submittals
- Activity: accountability



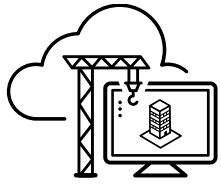


# Model Coordination

- Concept of coordination space
- Automated clash detection
- Cross tabulation analysis
- Model and coordination issue update
- Compare with experience with Navisworks Manage

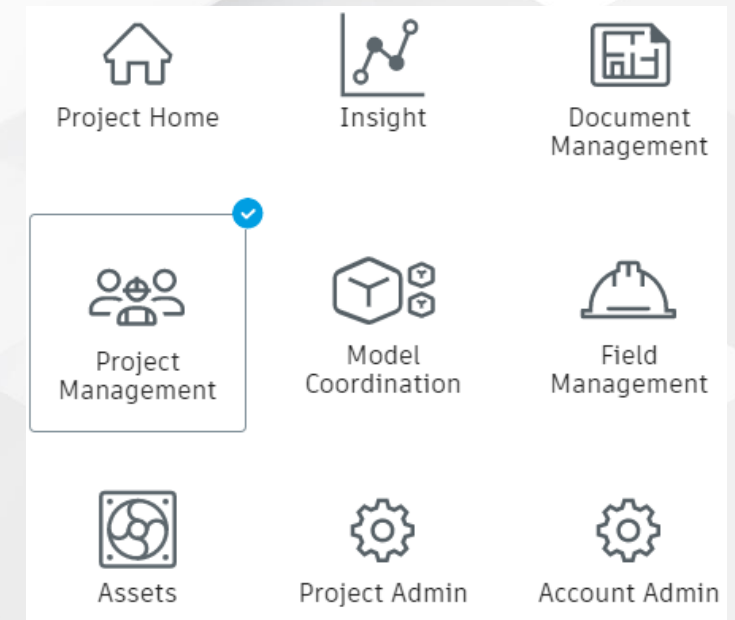


Small MOB Model Coordination ▾						
Last clash check 24 Feb 2021 18:58						
Active Assigned Closed						
Q Search for models Select a view All 6 models						
	Small M... Building_ Architecture_ 3D.rvt _hitecture	Small M... Building_ Architecture_ 3D.rvt _hitecture	Small M... Building_ Mech_Systems_ 3D.rvt - 3D_L1 MEP	Small M... Building_ Mech_Systems_ 3D.rvt - 3D_L2 MEP	Small M... Building_ Structure_ 3D.rvt _tructural	Small M... Building_ Structure_ 3D.rvt _tructural
Small Medical Offic... 3D_L1 Architecture		12	108	1	112	41
184 clash groups						
Small Medical Offic... 3D_L2 Architecture	11			44		73
111 clash groups						
Small Medical Offi...3D.rvt - 3D_L1 MEP	376				27	
394 clash groups						
Small Medical Offi...3D.rvt - 3D_L2 MEP	1	139				32
167 clash groups						
Small Medical Offic... - 3D_L1 Structural	171		15			2
176 clash groups						
Small Medical Offic... - 3D_L2 Structural	52	111		11	3	
142 clash groups						

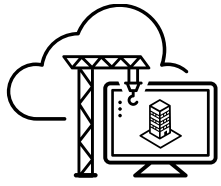


# Project Management

- Centralized RFIs and Submittals tracking
- Report function



RFIs							
SUBMITTALS							
MEETINGS							
Search RFI							
Export							
Create RFI							
Status	ID	Title	Assigned to	Company	Due date	Location	Document
OPEN	GC-12	(Janelle Miller) Tower Roof Connection	Molly Smith	CM220_Cohort_SP2...	May 31, 2021		-
OPEN	GC-11	F40 Footing Depth	Wei Wu	Fresno State Constr...	Mar 11, 2021		Small Medic...t.pdf
OPEN	GC-10	Jaklin Rowley Wall to Ground	Jaklin Rowley	CM220_Cohort_SP2...	-		Small Medi...D.rvt
CLOSED	GC-09	JoshuaWilkinson - Columns	Joshua Wilkinson	CM220_Cohort_SP2...	Mar 1, 2021		Small Medi...D.rvt
CLOSED	GC-08	(ElnazMohammadiyaghini) Door location	Elnaz Mohammadi...	CM220_Cohort_SP2...	Feb 28, 2021		Small Medi...D.rvt
CLOSED	GC-07	Gorham, Tolleman - Missing columns on front balcony?	Tolleman Gorham	CM220_Cohort_SP2...	Feb 25, 2021		Small Medi...D.rvt
CLOSED	GC-06	(JoshuaWilkinson) Roof Elevation	Joshua Wilkinson	CM220_Cohort_SP2...	Mar 1, 2021		Small Medi...D.rvt
CLOSED	GC-05	Roof Drainage	Molly Smith	CM220_Cohort_SP2...	Mar 3, 2021		Small Medi...D.rvt
CLOSED	GC-04	MLMS Clarification of Roof Area	Molly Smith	CM220_Cohort_SP2...	Mar 3, 2021	Middle Building Section (mu...	Small Medi...D.rvt



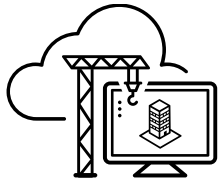
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# Model-based QTO & Change Management

- “I” in BIM
- Design iteration & change management \*
- Compare experience across Revit Schedules & Quantities, Navisworks Manage Quantification, and Assemble Systems



\* Best value overall by students' selection



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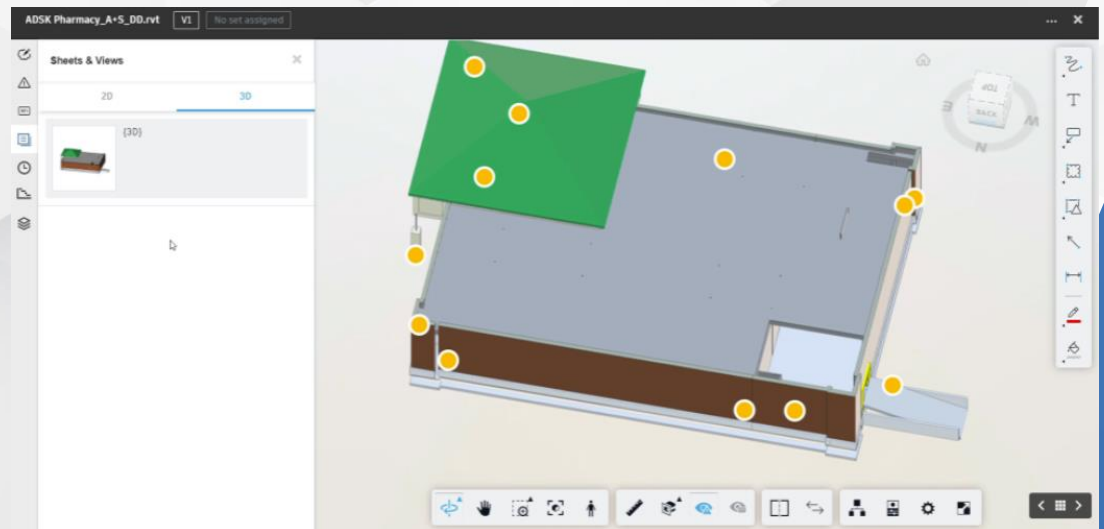
# Integration Project

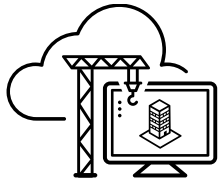
- Apply BIM 360 services in real world scenario
- Small multidisciplinary team collaboration to simulate business workflow to provide preconstruction services, including:
  - Document Management and Design Communication
  - Issues, RFIs, and Submittals Management
  - Design Coordination and Constructability Review
  - Project Phasing and Sequencing
  - Cost Modeling and Iterative Cost Estimate
  - Change Management
  - Sustainability and LEED Analysis
  - Site Logistics Planning

## Campus Pointe Pharmacy



Preconstruction Collaboration  
Final Report





# Individual Research

- Mini-paper with a topic on BIM 360 and preconstruction services
  - BIM 360 for constructability review and MEP/FP coordination
  - BIM 360 as a solution to design communication under COVID-19
  - Enhance OAEC communication in preconstruction with data visualization with BIM 360
  - Organizational readiness for integrated preconstruction services with BIM 360



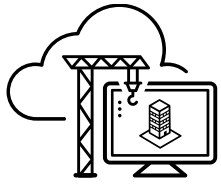
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# Lessons Learned





# Faculty Reflection

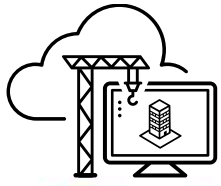
- Courseware extremely helpful
  - Clear learning objectives
  - “Run of show” for paced learning activity
  - Video tutorials valuable for a “flipped-classroom” model
- Balanced technical and non-technical content
  - Learning software vs. learning use cases
  - Multidisciplinary lens and teamwork is the key



# Student Reflection

- Technology
  - Easy to set up and easy to use
  - Videos tutorials are helpful
  - Handouts & case studies are relevant
- Implementation
  - Common data environment highly valuable
  - Activity stream enhances accountability and alleviate disputes
  - Change management & quick insights





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Thank you for a great semester with BIM 360! It rocks! Also thanks for always being there supporting us!  
- Wei

Thank you so much for your support and for providing us this opportunity, Steve! BIM 360 knowledge will be very useful in my future career.  
~ Elnaz

Autodesk has created an amazing platform for construction professionals. Thank you, Steve for the opportunity and support to learn firsthand how the preconstruction process can be made more efficient. I look forward to implementing Autodesk products in my company. Thank you again. - Joshua

Thank you for the support! I really enjoyed learning about BIM 360, and I am sure it will be very useful in my future career!  
- Tolleman

Thank you very much for the support, Steve! I am thankful for the opportunity to explore more about BIM 360.  
- Pablo

Thank you so much for allowing us the opportunity to "learn-by-doing." BIM 360 is fantastic, & I can't wait to see how AutoDesk continues to innovate for our industry! Thank you again for all your support!!  
~Molly

Thank you so much for the suport! I really appreciate everything you have done for us!  
~Nava

I very much appreciate your support! When I think about project delivery, BIM 360 is the first thing to come to mind.  
~ Farid

Thank you for your support and patience, Steve! The possibilities are endless with BIM 360!  
~Janelle





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# Questions?

[weiwu@mail.fresnostate.edu](mailto:weiwu@mail.fresnostate.edu)





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