

ARCH 2431 BUILDING TECHNOLOGY III
 1 lecture hours and 6 lab/studio hours, 4 credits

Course Description: This course studies the development of building systems & their assembly as they occur during the design development phase of architecture. The focus will be on steel construction. A series of studio lab assignments will develop an understanding of steel building assembly while introducing the students to the use of Building Information Modeling (BIM) software. Using case study research methods students will develop a comprehensive drawing set and using materials and assembly research students will develop façade studies.

Course context: This is the third in the required sequence of four building technology courses.

Prerequisites: ARCH 2331: Building Technology II with a grade of C or higher. Math 1275.

Required Texts:

Allen, Edward and Joseph Iano. *Fundamentals of Building Construction: Materials and Methods*. John Wiley and Sons, 2014.
 Ching, Francis. *Building Construction Illustrated*. John Wiley and Sons, 2014.

Recommended Text:

American Institute of Architects and Keith E. Hedges. *Architectural Graphic Standards: Student Edition, 12th Ed.* John Wiley and Sons, 2017.
 Lance Kirby, Eddy Krygiel, and Marcus Kim. *Mastering Autodesk Revit 2018*. John Wiley and Sons, 2017.
 Edward Allen and Joseph Iano. *The Architect's Studio Companion: Rules of Thumb for Preliminary Design, 6th Ed.* John Wiley and Sons, 2017.

Attendance Policy: No more than 10% absences are permitted during the semester. For the purposes of record, two late arrivals are considered as one absence. Exceeding this limit will expose the student to failing at the discretion of the instructor due to lack of class participation and mastery of class material.

Academic Integrity: Students and all others who work with information, ideas, texts, images, music, inventions and other intellectual property owe their audience and sources accuracy and honesty in using, crediting and citation of sources. As a community of intellectual and professional workers, the college recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension and expulsion.

Suggested Text: Texts will be assigned according to the subject covered that day.

Course Structure: Lectures and lab work. Assignments include a series of reports, class presentations, class notes, and a set of construction drawings. Digital tools learned in prior building technology courses are reinforced.

Grading:	30%	Studio Lab Assignments (as required)
	30%	Case Study & Comprehensive Drawing Set (cumulative grade of multiple presentations)
	30%	Materials Case Study & Façade Development (3d assembly studies and presentation)
	<u>10%</u>	<u>Class Participation</u>
	100%	Total

General Education Learning Outcomes / Assessment Methods	
Learning Outcomes	Assessment Methods
Upon successful completion of this course the student shall be able to:	To evaluate the students' achievement of the learning objectives, the professor will do the following:
<p>1. Knowledge Develop knowledge from a range of disciplinary perspectives, and develop the ability to deepen and continue learning.</p> <p>Depth of Knowledge Engage in an in--depth, focused, and sustained program of study. Pursue disciplined, Inquiry--based learning in the major.</p>	<p>1. Review students' research projects, notes, assignments, and final drawing sets and assess for a development of knowledge about materials and assemblies.</p>
<p>2. Skills Acquire and use the tools needed for communication, inquiry, analysis, and productive work</p> <p>Inquiry/ Analysis Derive meaning from experience, as well as gather information from observation. Understand and employ both quantitative and qualitative analysis to describe and solve problems, both independently and cooperatively. Employ scientific reasoning and logical thinking. Use creativity to solve problems.</p>	<p>2. Assess for how the student interprets the results of their research investigations and energy analyses into the development of their projects and as demonstrated by their final drawing sets.</p>
<p>3. Integration Work productively across disciplines.</p> <p>Integrate Learning Resolve difficult issues creatively by employing multiple systems and tools. Make meaningful and multiple connections among the liberal arts and between the liberal arts and the areas of study leading to a major or profession.</p>	<p>3. Review students' research projects, assignments, and final projects and assess for how the student interprets and applies their investigations into the development of their projects and as demonstrated by their final drawing sets.</p>
<p>4. Values, Ethics and Relationships Understand and apply values, ethics, and diverse perspectives in personal, professional, civic, and cultural/global domains.</p> <p>Professional/ Personal Development Demonstrate Intellectual honesty and personal responsibility. Discern consequences of decisions and actions Demonstrate intellectual agility and the ability to manage change. Work with teams, including those of diverse composition. Build consensus. Respect and use creativity.</p>	<p>4. Review students' ability to execute work through a collaborative process by working in teams for a semester long project and assess for an ability to consider and respect the viewpoints of others, evaluate options, and build consensus.</p>

National Architectural Accrediting Board (NAAB) Students Performance Criteria (SPC)/ Assessment Methods	
Learning Outcomes	Assessment Methods
<p>Upon successful completion of this course the student shall be able to: (Realm. Number) title [depth]</p>	<p>To evaluate the students' achievement of the learning objectives, the professor will do the following:</p>
<p>1. (B.3) Codes and Regulations [reinforced]</p> <p>ABILITY to design sites, facilities and systems consistent with the principles of life-safety standards, accessibility standards, and other codes and regulations.</p>	<p>1. Review students' final projects and notes and assess for a basic understanding of life-safety standards, accessibility standards, and local codes and regulations, and the ability to apply them to an architectural project.</p>
<p>2. (B.4) Technical Documentation [reinforced]</p> <p>ABILITY to make technically clear drawings, prepare outline specifications, and construct models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.</p>	<p>2. Review students' final drawings sets, outline specifications, and digital models, and assess for an understanding how materials, systems, and components are assembled into a building design, and the ability to produce a set of technically clear drawings that demonstrates how these elements are integrated into an architectural project.</p>
<p>3. (B.5) Structural Systems [reinforced]</p> <p>ABILITY to demonstrate the basic principles of structural systems and their ability to withstand gravity, seismic, and lateral forces, as well as the selection and application of the appropriate structural system.</p>	<p>3. Review students' final projects and notes and assess for the ability to demonstrate the basic principles of concrete structural systems and the ability to integrate a system into the development of an architectural project.</p>
<p>4. (B.7) Building Envelope Systems and Assemblies [reinforced]</p> <p>UNDERSTANDING of the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.</p>	<p>4. Review students' final projects and cladding research assignment and assess for an understanding of the basic principles involved in the appropriate selection and application of a building envelope system relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.</p>
<p>5. (B.8) Building Materials and Assembly [reinforced]</p> <p>UNDERSTANDING of the basic principles utilized in the appropriate selection of interior and exterior construction materials, finishes, products, components and assemblies based on their inherent performance including environmental impact and reuse.</p>	<p>5. Review students' final drawings sets, outline specifications, notes, and research assignments, and assess for an understanding of the basic principles utilized in the appropriate selection of interior and exterior construction materials, finishes, products, components and assemblies based on their inherent performance including environmental impact and reuse.</p>
<p>6. (B.10) Financial Considerations [reinforced]</p> <p>UNDERSTANDING of the fundamentals of building costs, which must include project financing methods and feasibility, construction cost estimating, construction scheduling, operational costs, and life-cycle costs.</p>	<p>6. Review students' notes and assess for an understanding of construction cost estimating.</p>

Course Specific Learning Outcomes / Assessment Methods	
Learning Outcomes	Assessment Methods
Upon successful completion of this course the student shall be able to:	To evaluate the students' achievement of the learning objectives, the professor will do the following:
1. Understand the process and requirements of developing a design from a schematic concept into design development drawings. (Knowledge)	1. Review students' process through individual desk critiques and frequent pin-ups and assess their final drawing sets.
2. Generate clear and concise talking points to guide oral presentations of research assignments. (Gen Ed)	2. Review students' presentations and assess for an ability to generate clear and concise talking points.
3. Understand the advantages and limitations of BIM (building information modeling) as a tool for design development and project delivery. (Skill)	3. Review students' process and final digital models and drawings sets and assess for an ability to use BIM as a tool for design development and project delivery.
4. Sketch and draft details in orthographic and 3-D views in analogue and digital media. (Skill)	4. Review students' process and detail drawings in final drawing sets and assess for the ability to produce both 3D and 2D detail drawings.
5. Apply knowledge of professional construction drawing standards for page composition, title blocks, annotation, and schedules. (Skill)	5. Review students' final drawing sets and assess for the appropriate use of standard architectural drawing conventions.
6. Develop a professional quality coordinated, edited, and organized set of design development documents for a given building design using BIM. (Skill)	6. Review students' final drawing sets and assess for the appropriate the content, coordination, and organization for a design development set of drawings.

- **Reading and quizzes:**

Reading assignments and short spot quizzes will be assigned at the discretion of the instructor. "Readings" may also consist of the review of visual materials including drawings and videos. Quizzes are scheduled during the first 10 minutes of each class, will start and end promptly and cannot be made up.

- **Class and submittals list:**

A complete submittals list will be provided for the semester long case study project.

- **Assignments:**

Detailed assignments sheets and grading policy will be provided.

Course Structure:

Course format will include a combination of any of the following activities:

- **Field Trips / High Impact Learning Practices:**

Field trips will look to visit existing buildings, similar to the typologies being studied, and the site of projects led by either the instructor or on-site experts in the field or the subject.

- **Lectures:**

Lectures will be given by a qualified instructor and if warranted invited guest lecturers or experts in the field or subject.

- **Activities:**

Students will participate in activities that provide them with the opportunity to apply what is learned in a given subject.

- **Research Activities:**

Students will be given directed research assignments and be required to integrate their investigations into their projects.

- **Pinup Presentations:**

Students will participate in written, oral and graphic presentations of the course subjects both to their peers and to outside guest critics.

Weekly Course Outline: (15 Week Semester)

Start Assignment #1 – Scavenger Hunt

WEEK 1	Day 01.	<u>Course Introduction</u>
	Activity 1	<i>Introduction to Building Technology III</i> – How this course is run -
	Activity 1	<i>What do you see?</i> Learn to read drawings: In class review & discussion of isometric building sections showing the assembly of buildings.
	Activity 3	<i>The Scavenger Hunt Assignment – an Introduction to BIM & Revit:</i> Introduction to the user interface, Building Information Modeling, project files and families. <i>Introduction the Scavenger Hunt Assignment.</i> Review assignment sheet. <i>Review the assignment sheet for more details.</i>
		Assignment 1.1 <i>Scavenger Hunt: Pinup #1</i> – For Next Class – Layout a minimum of 2 sheets
	Day 02	<u>Scavenger Hunt – Pinup #1</u>
	Pinup #1	<i>Pinup #1 Scavenger Hunt</i> - Review & Discussion
	Activity 2	<i>Scavenger Hunt Discussion:</i> What makes a good story? Understanding building assemblies and composing views as part of their exploration. Continued development of Revit skills. Create enlarged callout views at additional scales.
		Assignment 1.2 <i>Scavenger Hunt: Pinup #2</i> – For Next Class – Create six (6) new sheets
WEEK 2	Day 03	<u>Scavenger Hunt – Pinup #2</u>
	Pinup #2	<i>Pinup #2 Scavenger Hunt</i> - Review & Discussion
	Activity 2	<i>Scavenger Hunt Discussion:</i> Conducting research to understand an assembly. Locate & collect images related to your studies. Begin to add annotation (notes/leaders/dimensions) and materials designations. Work on Revit skills.
		Assignment 1.3 <i>Scavenger Hunt: Pinup #3</i> – For Next Class – 3 sheets & 3 boards of research
	Day 04	<u>Scavenger Hunt – Pinup #3</u>
	Pinup #3	<i>Pinup #3 Scavenger Hunt</i> - Review & Discussion
	Activity 2	<i>Scavenger Hunt Discussion:</i> Conducting research to understand an assembly. Locate & collect images related to your studies. Continue to develop Revit skills.
		Assignment 1.4 <i>Scavenger Hunt: Pinup #4</i> – Final graded pinup 3 studies due for next class

WEEK 3	Day 05	<u>Scavenger Hunt: Graded Pinup #4 (3 Sheets)</u>
	Pinup #4	<i>Pinup #4 Scavenger Hunt</i> – 3 Sheets - Review, discussion, and grading
	Activity 2	<i>Scavenger Hunt Discussion</i> : Peer critique of sheets and selection of “best sheet” to be developed. Discussion on how to make refine your study.
		Assignment 1.5 <i>Scavenger Hunt: Pinup #5</i> – For Next Class – Final graded pinup of best sheet.

Start Assignment #2 – Steel Connections

	Day 06	<u>Scavenger Hunt Final Pinup #5 & Intro. to Steel Connections Assignment</u>
	Pinup #5 Final	<i>Pinup #5 Scavenger Hunt</i> – Best Sheet - Review, discussion, and grading
	Activity 2	<i>Introduction to Steel Connections Assignment</i> : Discussion of Wide Flange, High Strength Steel Circular & Square Columns and Beams. Creating a steel assembly
	Activity 3	<i>Introduction to building Revit parametric families</i> : Steel Beams & Columns <i>Review the assignment sheet for more details.</i>
		Assignment 2.1 <i>Steel Connections: Pinup #1</i> - Match layout w/families for columns & beams

WEEK 4	Day 07	<u>Steel Connections: Pinup #1 - Introduction to custom Revit families</u>
	Pinup #1	<i>Pinup #1 Steel Connections</i> – 1 Sheet – Review & discussion.
	Activity 2	<i>Steel Connections</i> : Modify family models- add base plates and holes for bolts.
		Assignment 2.2 <i>Steel Connections: Pinup #2</i> – Modify & re-plot your first sheet with baseplates.

	Day 08	<u>Steel Connections: Pinup #2 - Development of details</u>
	Pinup #2	<i>Pinup #2 Steel Connections</i> – Updated Sheet – Review & discussion.
	Activity 2	<i>Steel Connections</i> : Add concrete flooring with opening for top of concrete footings. Add sets of four (4) coordinated detail views at $\frac{3}{4}$ " scale (plan/section/elevation/isometric). Add views of bolt connections at $1\frac{1}{2}$ " scale Add annotation (notes/leaders/dimensions) and materials poche.
		Assignment 2.3 <i>Steel Connections: Pinup #3</i> – Add concrete floor & second sheet with details.

WEEK 5	Day 09	<u>Steel Connections: Pinup #3 - Development of details</u>
	Pinup #3	<i>Pinup #3 Steel Connections</i> – 2 sheets for review and discussion.
	Activity 2	<i>Steel Connections</i> : Add fins & splice plate. Add additional details as needed.
		Assignment 2.4 <i>Steel Connections: Pinup #4</i> –Modify & plot sheets. Add new sheets as needed.

	Day 10	<u>Steel Connections: Pinup #4 - Development of details</u>
	Pinup #4	<i>Pinup #4 Steel Connections</i> –Review & discussion.
	Activity 2	<i>Steel Connections</i> : Add diagonal bracing and details as needed.
		Assignment 2.5 <i>Steel Connections: Pinup #5</i> – Final graded pinup and discussion
		Assignment 3.1 <i>Steel Case Studies: Pinup #1</i> – 3 Steel Building Case Studies (Tall/Medium/Small)

Start Assignment #3 – Steel Building Case Studies & Drawing Sets

WEEK 6	Day 11	<u>Connections Final Pinup #5 & Intro. to Bldg. Case Study Pinup #1</u>
	Pinup #5	<i>Pinup #5 Steel Connections</i> – Final graded pinup and discussion
	Pinup #1	<i>Case Study Pinup Review (3.1):</i> Review and discussion of student case studies. Overview of the use of steel assemblies in construction of various building types. <i>From this Pinup Teams will be formed for case study buildings.</i>
	Activity 3	<i>Team Case Study Research:</i> While students will begin to work as a team on a specific building, the first research pinup due next class is an individual assignment. Be prepared to present and discuss your research during next class. <i>Review the assignment sheet for more details.</i>

Assignment 3.2 Building Case Study: Pinup #2 –Grouped presentations of individual research.

	Day 12	<u>Steel Case Study & Drawing Set: Pinup #2 - Preliminary Research</u>
	Pinup #2	<i>Case Study Pinup #2 (3.2):</i> Review & discussion of student research.
	Activity 2	Team Research & Individual Drawings: Work as a team- research and begin to create individual Revit drawings. Begin by determining the structural grid, levels, and perimeter of the building. Add structural elements (steel columns).
		<i>Assignment 3.3 Building Case Study: Pinup #3</i> –Team presentation of Case Study Building Pinup must include a Revit Floor Plan & Bldg. Section <u>from each team member.</u>

WEEK 7	Day 13	<u>Steel Case Study & Drawing Set: - Pinup #3 - Graded Team Presentations</u>
	Pinup #3	<i>Pinup #3 Team Research Presentation (3.3)</i> – Graded as a team
	Activity 2	Team Research & Individual Drawings: Continue to work as a team but draw as an individual. Next identify & locate the vertical circulation cores (stairs/elevators) and add these to your drawing. Identify mechanical circulation (vertical shafts & horizontal distribution) and add to your drawings. Next identify main routes of circulation draw corridor walls – then begin to show demising walls that divide up spaces. Develop a Room & Door Numbering System.

Assignment 3.4 Building Case Study: Pinup #4.1, 4.2, 4.3, etc. – Individual Progress Pinups

	Day 14	<u>Steel Case Study & Drawing Set: - Pinup #4.x Daily Progress Pinups Begin</u>
	Pinup 4x	<i>Case Study Pinup #2 (3.2):</i> Review & discussion of student research.
	Activity 2	Team Research & Individual Drawing: Work as a team review research and begin to create individual Revit drawings. Begin by determining the structural grid, levels and perimeter of the building. Add structural elements (steel columns).
		<i>Assignment 3.4 Building Case Study: Pinup #4.1, 4.2, 4.3, etc.</i> – Individual Progress Pinups
		<i>Assignment 3.5 Building Case Study: Pinup #5.</i> – Structural Set Due & Graded next class

WEEK 8	Day 15	<u>Steel Case Study & Drawing Set: - Pinup #5 Structural Set</u>
	Pinup #5	<i>Progress Pinup Review 5 – Structural Set Review & Grading</i>
	Pinup 4x	<i>Progress Pinup Review 4.x – Individual Progress Pinups</i>
	Activity 3	Team Research & Individual Drawings: Work as a team & draw as an individual.
	Assignment 3.4	<u>Building Case Study: Pinup #4.1, 4.2, 4.3, etc.</u> – Individual Progress Pinups
	Day 16	<u>Steel Case Study & Drawing Set: - Pinup #4.x Daily Progress Pinups</u>
	Pinup 4x	<i>Progress Pinup Review 4.x – Individual Progress Pinups</i>
	Activity 2	Team Research & Individual Drawings: Work as a team & draw as an individual.
	Assignment 3.4	<u>Building Case Study: Pinup #4.1, 4.2, 4.3, etc.</u> – Individual Progress Pinups
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WEEK 9	Day 17	<u>Steel Case Study & Drawing Set: - Pinup #4.x Daily Progress Pinups</u>
	Pinup 4x	<i>Progress Pinup Review 4.x – Individual Progress Pinups</i>
	Activity 2	Team Research & Individual Drawings: Work as a team & draw as an individual.
	Assignment 3.6	<u>Building Case Study: Pinup #6</u> – Pre-Final Pinups due next class
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	Day 18	<u>Steel Case Study & Drawing Set: - Pinup #6 Pre-Final Pinup</u>
	Pre-Final Pinup	<i>Pre-Final Pinup & Review #6 – Individual Pre-final Pinups</i>
	Activity 2	Team Research & Individual Drawings: Work as a team & draw as an individual.
	Assignment 3.4	<u>Building Case Study: Pinup #4.1, 4.2, 4.3, etc.</u> – Individual Progress Pinups
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WEEK 10	Day 19	<u>Steel Case Study & Drawing Set: - Pinup #4.x Daily Progress Pinups</u>
	Pinup 4x	<i>Progress Pinup Review 4.x – Individual Progress Pinups</i>
	Activity 2	Team Research & Individual Drawings: Work as a team & draw as an individual.
	Assignment 3.7	<u>Building Case Study: Final Pinup #7.</u> – Final Pinup & Review next class
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	Day 20	<u>Steel Case Study & Drawing Set: - Pinup #7 – Final Pinup Review</u>
	Final Pinup	<i>Final Pinup #7 Review & Discussion – Final Graded Set of Drawings</i>
	Activity 2	Introduction to Facades Study: Introduction to facades assignment and student selection of research choices. One Opaque Wall System and one Glass Curtain Wall. For the glass curtain walls you will select one option from the either <u>Glass Curtain Wall Systems</u> (stick system or unitized system) for edge of slab connections or <u>Structural Glazing Systems</u> for multi-story atrium style spaces.
	Assignment 4.1	<u>Façade Study: Pinup #1</u> – Research Presentation on Chosen Façade Solutions
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Start Assignment #4 – Steel Building Case Studies & Drawing Sets

WEEK 11	Day 21	<u>Façade Studies: Pinup #1</u>
	Pinup #1	<i>Façade selections research Pinup #1 – Individual presentations.</i>
	Activity 2	Individual Research & Individual Drawings: Over the next few weeks work to understand your façade systems and to compose appropriate drawings to demonstrate your knowledge. Remember to work by composing 4 sets of coordinated views/details at the same scale. Appropriate scales for your detail drawings will include 1 ½”=1’-0” and 3”-1’-0”. In some instances, full size or one-half full-size details are appropriate. All drawings are to be fully annotated and dimensioned with materials poche. At the final presentation you will be required to present a minimum of 4 sheets (2 for each study) plus a PowerPoint/PDF presentation that demonstrates your understanding of how your systems are installed. <i>Review the assignment sheet for more details.</i>
		Assignment 4.2 <i>Façade Progress Pinup: Pinup #2 – Opaque System Revit Sheet</i>
	Day 22	<u>Façade Studies: - Pinup #2</u>
	Pinup #2	<i>Facade Pinup 4.2 – Opaque System Revit Sheet</i>
	Activity 2	Team Research & Individual Drawings: Work as a team & draw as an individual.
		Assignment 4.3 <i>Façade Progress Pinup: Pinup #3 – Glass Curtain Wall System Revit Sheet</i>
WEEK 12	Day 23	<u>Façade Studies: - Pinup #3</u>
	Pinup #3	<i>Facade Pinup 4.3 – Glass Curtain Wall System Revit Sheet</i>
	Activity 2	Individual Research & Individual Drawings: Work & draw as an individual.
		Assignment 4.x <i>Façade Progress Pinup: Pinup #4.x</i>
	Day 24	<u>Façade Studies: - Daily Progress Pinup</u>
	Pinup 4x	<i>Facade Pinup 4.x – Progress Pinup Both Studies</i>
		Assignment 4.x <i>Façade Progress Pinup: Pinup #4.x</i>

WEEK 13**Day 25** **Façade Studies:**

Pinup 4x ***Façade Pinup 4.x – Progress Pinup Both Studies***

Assignment 4.x ***Façade Progress Pinup: Pinup #4.x***

Day 26 **Façade Studies: - Daily Progress Pinup**

Pinup 4x ***Façade Pinup 4.x – Progress Pinup Both Studies***

As a reminder - Appropriate scales for detail drawings will include 1 ½"=1'-0" and 3"-1'-0". In some instances, full size or one-half full-size details are appropriate. All drawings are to be fully annotated and dimensioned with materials poche.

At the final presentation you will be required to present a minimum of 4 sheets (2 for each study) plus a PowerPoint/PDF presentation that demonstrates your understanding of how your systems are installed.

Assignment 4.5 ***Façade Pre-Final Pinup: Pinup #5 –Due next class***

WEEK 14**Day 27** **Façade Studies: Pinup #5 – Pre-Final**

Pinup #5 ***Façade Pinup 5 – Pre-Final Pinup Both Studies***

Assignment 4.X ***Façade Progress Pinup: –Individual Progress Pinup***

Day 28 **Façade Studies: - Daily Progress Pinup**

Pinup 5x ***Façade Pinup 5.x – Progress Pinup Both Studies***

Assignment 4.6 ***Façade Final Graded Pinup #6 – next 2 classes***

WEEK 15**Day 29** **Façade Studies: - Pinup #6 Final Review – Group 1**

Final Pinup ***Final Pinup & Jury Review – Group 1***

Day 30 **Façade Studies: - Pinup #6 Final Review – Group 2**

Final Pinup ***Final Pinup & Jury Review – Group 1***

Weekly Course Outline: (Summer Session)

WEEK 1	Day 1-4	<u>Scavenger Hunt & Introduction to Steel Connections</u>
	Days 1-4	<i>Scavenger Hunt</i>
	Day 4	<i>Introduction to Steel Connections</i>
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WEEK 2	Day 1-4	<u>Steel Connections & Steel Building Case Study & Drawing Set</u>
	Days 1-3	<i>Steel Connections</i>
	Day 3-4	<i>Steel Case Study & Drawing Set</i>
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WEEK 3	Day 1-4	<u>Steel Building Case Study & Drawing Set & Façade Studies</u>
	Days 1-3	<i>Steel Case Study & Drawing Set</i>
	Day 4	<i>Façade Studies</i>
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WEEK 3	Day 1-4	<u>Façade Studies</u>
	Day 1-4	<i>Façade Studies</i>
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