ARCH A004N: INTRODUCTION TO FRAMECAD STEEL FRAMING NONCREDIT

Item	Value
Curriculum Committee Approval Date	03/09/2022
Top Code	020100 - Architecture and Architectural Technology
Units	0 Total Units
Hours	18 Total Hours (Lecture Hours 18)
Total Outside of Class Hours	0
Course Credit Status	Noncredit (N)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	Yes; Repeat Limit 99
Open Entry/Open Exit	No
Grading Policy	P/NP/SP Non-Credit (D), • Letter Non-Credit (L)

Course Description

Introduction to FrameCAD Steel Framing is an overview of integrated steel panelization design and fabrication. Instruction includes entry level use of FrameCAD Structure and FrameCAD Detailer software as well as file export to FrameCAD Factory and machine. The class will produce and assemble a small sample project using the OCC FrameCAD F325iT. NOT DEGREE APPLICABLE. Not Transferable.

Course Level Student Learning Outcome(s)

1. Completers will be able to design, manufacture, and safely assemble a small steel frame project using FrameCAD software, an impact drill, and receiving output from a FrameCAD machine.
2. Completers will have a general knowledge of steel frame panelization design and manufacturing capabilities and basic knowledge of steel framing design considerations and codes.

Course Objectives

- 1. Recognize the basic procedures, codes, and components for steel framing and panelization.
- 2. Create a small structure using FrameCAD Structure and FrameCAD Detailer software systems at a beginner level.
- 3. Demonstrate how to export a design file to the FrameCAD machine for fabrication .
- 4. Demonstrate safe work area procedures in and around the FrameCAD machine and lab work areas.

Lecture Content

Industry overview on steel framing and panelization Cold Form Steel (CFS) definition, ASTM Framing shapes, conventional framing Benefits of custom fabrication Less than 1% waste Less material transport trips Reduced labor force Less skilled labor Increased strength No termites, no fire Quicker assembly Design considerations Integrated engineering design Spacing Thermal bridging Insulation Sheathing options Code and permitting overview for steel frame construction Prescriptive vs code tables Structure calculations Loads and locational settings Bracing methods FrameCAD Structure software Overview Tutorial for a small project FrameCAD Detailer software Overview Machine config settings Continuation of Tutorial Exporting xml files to FrameCAD Factory software Saving and naming project File formats Export xml to machine Review final project and exit survey Review final project Discuss transport and bolt down procedures Discuss project process Take final survey Machine and Workspace Safety 440 Power safety, generator Workspace safety zones Decoiler, Machine Output area safety Eye projection and gloves, shoes Production safety Panel completion and assembly Workspace safety Drill operation and safety Screw types and use Safe carry and material movement Assembling panels Review final project - Discuss photograph

Lab Content

I. Machine and Workspace Safety A. 440 Power safety, generator nbsp; B. Workspace safety zones C. Decoiler, Machine D. Output area safety E. Eye projection and gloves, shoes F. Production safety 'Times New Roman'; II. Panel completion and assembly A. Workspace safety B. Dri ll operation and safety C. Screw types and use D. Safe carry and material movement mal; font-family: 'Times New Roman'; E. Assembling panels III. Review final project - Discuss photograph

Method(s) of Instruction

- Enhanced NC Lect (NC1)

Instructional Techniques

Instructional methods will include: lecture, lecture-demonstrations, class discussions, video tutorials, video demonstrations, tour of facilities and projects on-site, hands-on demonstrations and practic, and guided production and assembly of parts.

Reading Assignments

FrameCAD manuals will be provided via PDF for students to review and reference during class and students will be shown how to access the in-program tutorials and references. Students will design and digitally draft a small project using FrameCAD Structure software and will run analysis software on the design. Students will configure FrameCAD Detailer and import their project from FrameCAD Structure into FrameCAD Detailer. Students will transfer their file to the FrameCAD Factory software for manufacture. One project will be produced and assembled by the class. Students will take an exit survey with questions and a written statement.

Writing Assignments

Student will write a brief statement as part of their exit survey.

Out-of-class Assignments

Students will be assigned to research and confirm windows and door openings or other apertures and components needed to be located in their FrameCAD project. Students will be assigned to research online city code and planning requirements for a proposed (hypothetical) project and comply with applicable rules for their project. Students will be assigned to summarize their findings and collect their notes and documents into a project folder. Students will also print out their project reports and panel drawings to include in this project reference folder. Out of class readings, assignments, and written work will total approximately 2-3 hours per week (or about 36 hours total).

Demonstration of Critical Thinking

Critical thinking will be engaged in the process of applying steel frame knowledge to a project that will be input and developed in design and engineering software. Students will need to make critical decisions and adjustments for the project to pass the software engineering testing.

Required Writing, Problem Solving, Skills Demonstration

Problem solving and skills will be demonstrated by the development of a project file for manufacture on the machine. Success will be if the project can be read by the machine or if the student can determine what parameters need to be adjusted for the file to run. Students will assemble a small project produced by the machine and demonstrate safe working around the machine and workspace, and proper operation of an impact drill. Students will collect and organize notes, handouts, research materials, project print outs and all relevant documents into a resource notebook.

Eligible Disciplines

Architecture: Any bachelor's degree and two years of professional experience, or any associate degree and six years of professional experience. Construction technology: Any bachelor's degree and two years of professional experience, or any associate degree and six years of professional experience. Engineering: Master's degree in any field of engineering OR bachelor's degree in any of the above AND master's degree in mathematics, physics, computer science, chemistry, or geology OR the equivalent. (NOTE: A bachelor's degree in any field of engineering with a professional engineer's license is an alternative qualification for this discipline.) Master's degree required. Title 5, section 53410.1

Manuals Resources

1. FrameCAD. FrameCad Structure Procedures Overview, FrameCAD Limited , 03-01-2017 2. FrameCAD. Detailer Configuration Quick Start, FrameCAD Limited , 03-01-2017 3. FrameCAD. FrameCAD Detailer Plus, FrameCAD Limited , 03-01-2017