



WEI@CalPoly Presents WEI 401 – Introduction to Timber Design

Enrollment Start:	Jun 8, 2012
Course Start:	Sep 14, 2012
Concluding Hands on Workshop:	Dec 15-16, 2012
Fee:	\$1,350
Additional costs:	Workshop travel costs
Class Size:	32 students
Course Hosting:	http://nees.org/education/wood-education-institute (Note: NEES registration is required to register for the course).
Instructors:	Dr. Charles Chadwell, PhD, P.E., Cal Poly SLO Prof. Mikhail Gershfeld, S.E., Cal Poly Pomona

Welcome

Welcome to the WEI@CalPoly Timber Design online course, WEI 401. The course is made available through support by Wood Product Council (WPC) through Woodworks initiative, and cooperation between NEES, WEI and Cal Poly Pomona and San Luis Obispo Civil Engineering Programs. We are determined to make this a successful educational experience and look forward to having you in this class.

Prof. Mikhail Gershfeld, SE, Chair WEI

Dr. Charles Chadwell PhD, P.E. Co-Chair WEI

Wood Education Institute (WEI)

The Wood Education Institute was established in 2008 to address the growing need for timber design courses in undergraduate and graduate civil engineering programs as well as to offer a resource for design professionals' continuing education. The WEI course modules were developed by faculty of several universities and financially supported by the Wood Product Council's Woodworks initiative. For more information please visit www.woodeducationinstitute.org

NEES and NEEShub

The George E. Brown Network for Earthquake Engineering Simulations (NEES) provides hosting for WEI courses on the NEEShub. NEES and WEI joined efforts to bring online education to engineering professionals as part of their mission of dissemination of research findings to the design community. Please visit www.nees.org for additional information and to access the course.

About the Course

WEI 401 is a 12 week online course culminating in a two-day hands-on workshop. This course is intended for practicing professionals who did not have a timber design course in their undergraduate program or would like to refresh and update their knowledge. This course allows industry practitioners to learn (or review) the fundamentals of designing with wood in a structured self-paced environment. The course is taught with six two-week sessions fully online, with each session devoted to a specific topic, and culminates in a two-day weekend hands-on workshop (optional). The two-week per subject schedule allows students to pace themselves and schedule their studies to accommodate their professional and family commitments. Each session possess essential questions to be answered, outlines detailed learning objective, and provides two to five compact online streaming learning modules, reading assignments, practice problems, and short and specific assessments.



The final session concludes with in person two day weekend workshop on Cal Poly San Luis Obispo Campus. The workshop will include laboratory component, where students can investigate specific aspects of the behavior of wood, and a design studio component, where students can apply their knowledge to practical design applications. Upon successful completion of this course, the student will be well versed in specification of wood materials and design of basic wood frame structures.

Course Outline

Start date: Sep 14, 2012 **End date:** Oct 1, 2012 **Duration:** 2 weeks

Topic 1: Design properties of wood, grading and adjustment factors for Sawn Lumber

Learning Objective: Using 2005 NDS, to be able to classify sawn lumber based on its use, select appropriate reference design values and identify all applicable adjustment factors.

Start date: Oct 1, 2012 **End date:** Oct 15, 2012 **Duration:** 2 weeks

Topic 2: Design properties of wood materials and adjustment factors for Engineered Wood – structural panels, glued laminated beams, other.

Learning Objective: Using 2005 NDS and APA Construction Guide, to be able to specify structural wood panels and glued-laminated structural beams and columns; select appropriate stress class and combination symbols for beams and columns; select appropriate reference design values and identify all applicable adjustment factors.

Start date: Oct 15, 2012 **End date:** Oct 29, 2012 **Duration:** 2 weeks

Topic 3: Design for axial, bending, and combined stresses (combining tension and bending stresses, compression and bending stresses, and bi-axial bending).

Learning Objective: Using 2005 NDS to be able to calculate capacity of sawn lumber and glued laminated timber to resist different loads and load combinations for both ASD and LRFD methodologies.

Start date: Oct 29, 2012 **End date:** Nov 12, 2012 **Duration:** 2 weeks

Topic 4: Connections Design (Nails, Bolts, and Lag Screws)

Learning Objective: To be able to develop geometrical layout of basic wood connections for dowel type connections fasteners, such as bolts and lag screws and evaluate connection capacity

Start date: Nov 12, 2012 **End date:** Nov 26, 2012 **Duration:** 2 weeks

Topic 5: Wood diaphragm analysis and design

Learning Objective: Explain behavior and preferred failure modes of wood diaphragm and determine diaphragm capacity based on material properties, fastener type, fastener spacing, and construction practices using 2005 SDPWS (Seismic Design Provisions for Wind and Seismic Loads).

Start date: August 17, 2012 **End date:** August 31, 2012 **Duration:** 2 weeks

Topic 6: Wood shear-walls analysis and design (Segmented, Perforated and FTAO methodologies)

Learning Objective: Be able to explain behavior of the wood-frame shear walls and using 2005 SDPSW to be able to perform analysis and design with three methods allowed by the code.

Start date: September 8, 2012 **End date:** September 9, 2012 **Duration:** 2 weeks

2-day workshop (Hands on applications)