Course Information:
Semester:
Lecture Day:
Lecture Time:
Lecture Location:
Credit Hours: 3

Instructor Information:
Instructor:
Email:
Office:
Phone:
Office Hours:

Course Catalog Description: This course will give students an overall understanding of modular construction (modularization) concepts including, advantages, disadvantages, impediments, industry status, business case process, execution plan, critical success factors, and standardization strategy of modularization.

Prerequisites: Graduate standing.

Required Skills: Understanding of conventional stick-built construction method, practices, and management.

Course Format: This course will be conducted in a lecture format. Class lectures are premised on familiarity with assigned readings. Therefore, class material will not necessarily replicate assigned reading material and will be covered on exams. Students are expected to participate in reading groups throughout the semester. The reading assignments will be made each week, and the reading materials (journal articles or reports) will be available on Blackboard. The student is responsible for all reading assignments and class handouts whether or not covered in class or listed on the syllabus. It is recommended that students bring their copy of reading materials to each lecture (used as a reference). Also, PPT slides will be available on Blackboard and students are expected to have their copy of PPT slides with them in class.

Course Requirements: Students will engage in the following activities:
• Attend class (missed classes will be subtracted from your final grade in the class)
Read assigned material before class sessions
Participate in class discussions
Complete two project assignments (report and presentation)
Complete a term project - synthesis report
Complete an examination

Late Policy: NO late report or tests.

Out-of-class Assignments and Due Dates (Refer to the schedule in the last page)

Learning Outcomes:
- define/describe/explain module, prefabrication, preassembly, off-site construction, modularization, PPMOF, and accelerated bridge construction (ABC).
- describe the key concepts and characteristics of modular construction;
- explain the key advantages, disadvantages, barriers, drivers, and enablers of modularization;
- discuss factors related to module transportation;
- apply the modularization business case process and the PPMOF tool, calculate a net present value for modular project, compare total installation costs between modularization and stick-built projects, and determine go/no-go for modularization;
- list execution plan differences for modularization;
- list modularization critical success factors for modularization
- describe standardization strategy for modularization;
- recognize the shipbuilding construction philosophy transformation and explain a path forward for construction.

Required and Recommended Books and Materials:

Text Book:

Recommended Reference Books and Articles:
- CII. (2002). Implementing the Prefabrication, Preassembly, Modularization, and Offsite Fabrication Decision Framework: Guide and Tool. The University of Texas at Austin: Construction Industry Institute, Austin, TX.
- CII. (2011). Transforming Modular Construction for the Competitive Advantage through the Adaptation of Shipbuilding Production Processes to Construction. The University of Texas at Austin: Construction Industry Institute, Austin, TX.
• Lawson et al. (2014). “Design in Modular Construction.”

Optional Readings:


Course Topics:
The following topics will be covered in the course. The following listing is a general indication of the order of their coverage. However, I reserve the right to change the order of coverage and the topics to be covered based on the class’s performance and interests.
• Introduction of Modular Construction
• Advantage & Disadvantage of Modular Construction
• Industry Status on Modular Construction
• Module Types
• Opportunities and Challenges of Modular Methods in Dense Urban Environment
• Module Transportation
• CII Strategic Decision Tool for PPMOF
• Business Case Process and Analysis Execution Plan Differences
• Critical Success Factors and Enablers
• Automation in Modular Construction
• Standardization Strategy
• Industry-wide Maximization Enablers
• Modular Building
• Accelerated Bridge Construction
• Hospital Modularization
• Solar Decathlon Modularization
• Design Standardization
• Factory Production
• Learnings from Shipbuilding Industry

**Assignment Weights:**
Grade components will be weighted as follows in the computation of the final course grade:

- Participation and Attendance 5%
- Project 1 15%
- Project 2 10%
- A Comprehensive Exam 40%
- Synthesis Report 30%

**Grading Scale:**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Score Range</th>
<th>Subjective Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 90%</td>
<td>Superior knowledge</td>
</tr>
<tr>
<td>B+</td>
<td>≥ 87%</td>
<td>Good knowledge</td>
</tr>
<tr>
<td>B</td>
<td>≥ 84%</td>
<td>Minimum knowledge</td>
</tr>
<tr>
<td>B-</td>
<td>≥ 80%</td>
<td>Did not meet minimum knowledge standards</td>
</tr>
<tr>
<td>C</td>
<td>≥ 70%</td>
<td>Did not meet minimum knowledge standards</td>
</tr>
<tr>
<td>D</td>
<td>≥ 60%</td>
<td>Did not meet minimum knowledge standards</td>
</tr>
<tr>
<td>F</td>
<td>Below 60%</td>
<td>Did not meet minimum knowledge standards</td>
</tr>
</tbody>
</table>

**Homework:**  Homework will be due at the commencement of the specified class period. Assignments must be submitted before or when due even if the student will be absent from class on the due date. Assignments with spelling, grammatical, or mechanical errors—or with obvious erasures, cramped margins, coffee stains, etc.—will be downgraded.

When sources are used to complete assignments students are expected to cite the sources. Students should use the ASCE version of citations. More information about the citation format can be found at
Class Participation and Attendance: Class participation grades are based on the instructor’s perception of student interaction and active participation in the classroom. It is important that you are familiar with the course material as the course evolves. Your ability to answer questions and discuss the material will be part of the overall participation evaluation. Therefore, you should review class material ahead of time. Regular attendance is expected and encouraged. Your attendance will be used to evaluate your participation grade. I consider a student missing more than one week of class lectures without excuse to be a serious participation problem. Each student is responsible for all material and administrative instructions given during the lecture period.

Class Attendance Policy: Class attendance is vital for student and professor communication and learning. Attendance is mandatory. Because many of our students are employed, the Construction Management faculty has established a policy that considers the needs of our students. This policy allows for some authorized absences. However, no more than four (4) employment-related excused absences will be allowed. Employment-related absences require an official letter from the employer’s human resources department (NO EXCEPTIONS – a note from your project manager is not acceptable). The letter must be on official company letterhead and signed by the human resources department manager. At the instructor’s sole discretion employment-related absences may be independently verified with the human resources department. If your human resources manager will not provide the necessary documentation, then the absence is unexcused. Medically-excused absences must be accompanied by an official document written by a physician. More than four (4) or more unauthorized class absences will result in a failing grade. The student is personally responsible for acquiring the information missed as a result of absence, excused or otherwise. If you miss class for any reason, you are still responsible for the material and content of the class and any assignment given for the next class. Also, assignments must be submitted when due even if the student will be absent from class on the due date. Students who are not present for the entire class period or who are unprepared for class may also accrue absences. Late arrivals, early departures, and class sessions for which you are unprepared are all considered equivalent for grading purposes.

Communication Skills: Communication skills are paramount to a successful career. Therefore, communication skills, written and oral, will be evaluated in all coursework. Lengthy and major assignments involving significant writing will have writing as 30 percent of their evaluation criteria. To get more help about writing you may access at http://writingcenter.unlv.edu/

Examination: An examination will be a closed book and closed notes. Missed examinations will count as zero if prior authorization is not granted. Make-up examinations will be given under extraordinary circumstances only. No make-up examinations will be given beyond one week (7 days) after the original exam date regardless of reason. Make-up examinations will cover material similar to the original exam, but may be of a different format and different composition of types of questions. The exam will be comprehensive. Time and location will be TBD.
UNIVERSITY POLICIES

Public Health Directives
Face coverings are mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. UNLV public health directives are found at https://www.unlv.edu/coronavirus/health-requirements. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the UNLV Code of Student Conduct, https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf, including being administratively withdrawn from the course.

Academic Misconduct
Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV’s educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person, from the Internet or any other source without proper citation of the source(s). See the Student Conduct Code, https://www.unlv.edu/studentconduct/student-conduct.

Auditing Classes
Auditing a course allows a student to continue attending the lectures and/or laboratories and discussion sessions associated with the course, but the student will not earn a grade for any component of the course. Students who audit a course receive the same educational experience as students taking the course for a grade, but will be excused from exams, assessments, and other evaluative measures that serve the primary purpose of assigning a grade.

Classroom Conduct
Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn, or of instructors to teach. Use of electronic devices such as pagers, cellular phones, or recording devices, or potentially disruptive devices or activities are only permitted with the prior explicit consent of the instructor. The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative withdrawal of the student from the course.

Copyright
The University requires all members of the University Community to familiarize themselves with, and to follow copyright and fair use requirements. You are individually and solely responsible for violations
of copyright and fair use laws. The University will neither protect nor defend you, nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional copyright policy information is available at https://www.unlv.edu/provost/copyright.

Disability Resource Center (DRC)
The UNLV Disability Resource Center (SSC-A, Room 143, https://www.unlv.edu/drc, telephone 702-895-0866) provides resources for students with disabilities. Students who believe that they may need academic accommodations due to injury, disability, or due to pregnancy should contact the DRC as early as possible in the academic term. A Disabilities Specialist will discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours, so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Final Examinations
The University requires that final exams given at the end of a course occur on the date and at the time specified in the Final Exam schedule. The Final Exam schedule is typically available at the start of the semester, and the classroom locations are available approximately one month before the end of the semester. See the Final Exam Schedule, https://www.unlv.edu/registrar/calendars.

Identity Verification in Online Courses
All UNLV students must use their Campus-issued ACE ID and password to log in to WebCampus-Canvas.

UNLV students enrolled in online or hybrid courses are expected to read and adhere to the Student Academic Misconduct Policy, https://www.unlv.edu/studentconduct/misconduct/policy, which states that “acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment” is a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute, and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy.

UNLV students enrolled in online courses are also expected to read and adhere to the Acceptable Use of Computing and Information Technology Resources Policy, https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy, which prohibits sharing university accounts with other persons without authorization.
To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus-Canvas or another UNLV-managed platform that requires ACE login credentials for access.

**Incomplete Grades**
The grade of “I” (Incomplete) may be granted when a student has satisfactorily completed three-fourths of course work for that semester/session, but cannot complete the last part of the course for reason(s) beyond the student’s control and acceptable to the instructor, and the instructor believes that the student can finish the course without repeating it. For undergraduate courses, the incomplete work must be made up before the end of the following regular semester. Graduate students receiving “I” grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the period indicated, a grade of “F” will be recorded, and the student’s GPA will be adjusted accordingly. Students who are fulfilling an Incomplete grade do not register for the course, but make individual arrangements with the instructor who assigned the “I” grade.

**Library Resources**
Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the Libraries’ Research Consultation website, https://guides.library.unlv.edu/appointments/librarian. You can also ask the library staff questions via chat and text message at https://ask.library.unlv.edu/.

**Missed Classwork**
Any student missing class, quizzes, examinations, or any other class or laboratory work because of observance of religious holidays will be given an opportunity during that semester to make up the missed work. The make-up opportunity will apply to the religious holiday absence only. It is the responsibility of the student to notify the instructor within the first 14 calendar days of the course for Fall and Spring courses (except for modular courses), or within the first 7 calendar days of the course for Summer and modular courses, of their intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit the Missed Work policy, under Registration Policies, on the Academic Policies webpage, https://catalog.unlv.edu/content.php?catoid=29&navoid=7326.

In accordance with the policy approved by the Faculty Senate regarding missed class time and assignments, students who represent UNLV in any official extracurricular activity will also have the opportunity to make up assignments, provided that the student provides official written notification to the instructor no less than one week prior to the missed class(es).

The spirit and intent of the policy for missed classwork is to offer fair and equitable assessment opportunities to all students, including those representing the University in extracurricular activities. Instructors should consider, for example, that in courses which offer a “Drop one” option for the lowest
assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activity is both contrary to the intent of the Faculty Senate’s policy, and an infringement on the student’s right to complete all work for the course.

This policy will not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the University that could be reasonably avoided. There should be a good faith effort by both the instructor and the student to agree to a reasonable resolution. When disagreements regarding this policy arise, decisions can be appealed to the Department Chair/School Director, College/School Dean, and/or the Faculty Senate Academic Standards Committee.

For purposes of definition, extracurricular activities may include, but are not limited to: academic recruitment activities, competitive intercollegiate athletics, fine arts activities, liberal arts competitions, science and engineering competitions, and any other event or activity sanctioned by a College/School Dean, and/or by the Executive Vice President and Provost.

**Rebelmail**
Rebelmail is UNLV’s official email system for students and by University policy, instructors and staff should only send emails to students’ Rebelmail accounts. Rebelmail is one of the primary ways in which students receive official University communications, information about deadlines, major Campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the University. Emailing within WebCampus-Canvas is also acceptable.

**Tutoring and Coaching**
The Academic Success Center (ASC) provides tutoring, academic success coaching, and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, please visit the [ASC website](https://www.unlv.edu/asc), or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of SSC A, Room 254. Drop-in tutoring is located on the second floor of the Lied Library, and on the second floor of the College of Engineering building (TBE A 207).

**UNLV Writing Center**
One-on-one or small group assistance with writing is available free of charge to UNLV students at the [Writing Center](https://writingcenter.unlv.edu/), located in the Central Desert Complex, Building 3, Room 301 (CDC 3–301). Walk-in consultations are sometimes available, but students with appointments receive priority assistance. Students may make appointments in person or by calling the Center, telephone 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.
Diversity Statement
As an institution of higher learning, UNLV represents a rich diversity of human beings among its faculty, staff, and students, and is committed to aspiring to maintain a Campus environment that values that diversity. Accordingly, the University supports understanding and appreciation of all members of its community, regardless of race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity, marital status, pregnancy, genetic information, veteran status, or political affiliation. Please see University Statements and Compliance, https://www.unlv.edu/about/statements-compliance.

A successful learning experience requires mutual respect and trust between the students and the instructor. Accordingly, the instructor asks that students be willing to listen to one another’s points of view, acknowledging that there may be disagreements, keep discussion and comments on topic, and use first person, positive language when expressing their perspectives.