FLORIDA ATLANTIC UNIVERSITY

NEW COURSE PROPOSAL
Undergraduate Programs

Department CIvil, Environmnetal and Geomatics Engineering

College Engineering and Computer Science

(*To obtain a course number, contact* ***erudolph@fau.edu***)

UUPC Approval 10/7/24
UFS Approval
SCNS Submittal
Confirmed
Banner Posted
Catalog

Prefix CES

Number 4830

(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)

Lab Code

Type of Course Lecture

Course Title Masonry Design

Credits *(See Definition of a Credit Hour)* 3

Grading *(Select One Option)*

Regular (●)

Sat/UnSat ( )

Effective Date *(TERM & YEAR)* Spr 25

Course Description *(Syllabus must be attached; see Template and Guidelines)*
This course covers the fundamental concepts and theories of masonry structure analysis and design. This course includes the material properties of clay and concrete masonry materials; the behavior of reinforced masonry structures; concepts of design and proportioning sections for strength and serviceability; background of the Masonry Standards Joint Committee's (MSJC) specification.

Prerequisites, with minimum grade* CES3102C, CGN3501C

Corequisites n/a

Registration Controls *(Major, College, Level)* n/a

Default minimum passing grade is D-.** **Prereqs., Coreqs. & Reg. Controls are enforced for all sections of course

WAC/Gordon Rule Course

☐ **Yes** ☑ **No**

WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See WAC Guidelines.

Intellectual Foundations Program (General Education) Requirement *(Select One Option)*

None

General Education criteria must be indicated in the syllabus and approval attached to the proposal. See Intellectual Foundations Guidelines.

Minimum qualifications to teach course

Ph.D. in structural engineering

Faculty Contact/Email/Phone

Frederick Bloetshcer, fbloetsc@fau.edu 239-250-2

List/Attach comments from departments affected by new course

n/a

Approved by	***Date***
Department Chair	9/23/24
College Curriculum Chair Galan Liu	9/23/24
College Dean	9/24/24
UUPC Chair Korey Sorge	10/7/24
Undergraduate Studies Dean Dan Meeroff	10/7/24
UFS President	
Provost	

Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.

FLORIDA ATLANTIC UNIVERSITY

CES 4830-001 15662

Masonry Design

Wednesday 7:10 PM - 10:00 PM

3 Credit(s)

Fall 2025 - 1 Full Term

Instructor Information

Jinwoo Jang
Email: jangj@fau.edu
Office: EE314
Office Hours: Wednesday 1-3 PM
Phone: 561.297.2987

Course Description

Prerequisite: CES3102C, CGN3501C

This course covers the fundamental concepts and theories of masonry structure analysis and design. This course includes the material properties of clay and concrete masonry materials; the behavior of reinforced masonry structures; concepts of design and proportioning sections for strength and serviceability; background of the Masonry Standards Joint Committee's (MSJC) specification.

Instructional Method

In-Person
Traditional concept of in person. Mandatory attendance is at the discretion of the instructor.

Required Texts/Materials

Design of Reinforced Masonry Structures
ISBN: 9780071593670
Publisher: McGraw-Hill Professional Publishing
Edition: 2nd

Design of Reinforced Masonry Structures
ISBN: 9780071475556
Publisher: McGraw-Hill
Edition: 2nd

Course Objectives/Student Learning Outcomes

Course objectives

Upon successful completion of this course, students will be able to:

- Understand basic masonry materials, including clay brick, concrete block, mortar, grout, and reinforcements.
- Analyze the flexural strength of masonry beams and design reinforcements.
- Design for shear in reinforced masonry beams
- Analyze and design lintels in masonry structures
- Design axially loaded reinforced masonry columns

Student learning outcomes & relationship to program/ ABET outcomes 1-7

- Ability to understand the basic principles governing the design of masonry concrete. (1, 2).
- Ability to interrelate analysis and design for members of the total structural system (1, 2, 4)
- Ability to develop an understanding of the internal strain distributions in reinforced masonry elements and a basic understanding of the reserve strength and load factors (1, 2)
- Ability to bridge the gap between the classroom and actual design practice through the use of the MSJC Building Code and exposure to open-ended problems. (1, 2)

Relationship to program educational objectives

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics - High
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors - High
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global - Medium

Faculty Rights and Responsibilities

Florida Atlantic University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. To ensure these rights, faculty members have the prerogative to:

• Establish and implement academic standards.

• Establish and enforce reasonable behavior standards in each class.

• Recommend disciplinary action for students whose behavior may be judged as disruptive under the Student Code of Conduct University Regulation 4.007.

Disability Policy

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

Course Evaluation Method

The minimum grade required to pass the course is "C."

This course adopts a relative grading system. Student grades will be determined by comparing their overall performance based on grading criteria against those of their peers. There are no pre-specified (absolute) standards for grading scale. The outcomes of a student's test, project, or assignment will be converted to rankings and percentiles in relation to grades from other students in the course. Relative grading is similar to bell curving or grading on a curve, and considers the highest score as the baseline (A), relatively adjusting all others compared to that score.

Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Attendance Policy Statement

Students are expected to attend all their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations, or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances, and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Religious Accommodation Policy Statement

In accordance with the rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs regarding admissions, registration, class attendance, and the scheduling of examinations and work assignments. University Regulation 2.007, Religious Observances, sets forth this policy for FAU and may be accessed on the FAU website at www.fau.edu/regulations.

Any student who feels aggrieved regarding religious accommodations may present a grievance to the director of Equal Opportunity Programs. Any such grievances will follow Florida Atlantic University's established grievance procedure regarding alleged discrimination.

Time Commitment Per Credit Hour

For traditionally delivered courses, not less than one (1) hour of classroom or direct faculty instruction each week for fifteen (15) weeks per Fall or Spring semester, and a minimum of two (2) hours of out-of-class student work for each credit hour. Equivalent time and effort are required for Summer Semesters, which usually have a shortened timeframe. Fully Online courses, hybrid, shortened, intensive format courses, and other non-traditional modes of delivery will demonstrate equivalent time and effort.

Course Grading Scale

The instructor will calculate your grade based on the following weighted distribution:

Assessment	Total Points	Percentage (%)
Homework	100	30%
Midterm	100	30%
Final exam	100	40%
TOTAL:	300	100%

Homework (30%)

All homework must be completed individually in a neat and clear manner. It is encouraged to use engineering papers. Students need to scan their homework and submit it through Canvas or submit it in person.

Midterm (30%) and Final Exam (40%)

Examinations will be based on lectures and homework. The exams might include multiple choice, true/false, and/or short answer questions, and calculations. Answers will be evaluated based on content in terms of accuracy of information and ability to solve design problems. Good answers will demonstrate that you have read and understood the chapters, and actively participated in classroom discussions. The test will be timed. Participation in University-approved activities or religious observances, with prior notice, will not be penalized. Keep copies of all quizzes and homework assignments for ABET purposes.

Grade Appeal Process

You may request a review of the final course grade when you believe that one of the following conditions apply:

• There was a computational or recording error in the grading.

• The grading process used non-academic criteria.

• There was a gross violation of the instructor's own grading system.

University Regulation 4.002 of the University Regulations contains information on the grade appeals process

Policy on Make-up Tests, Late work, and Incompletes

Late assignments policy

Students will have a week to do homework. Late homework will have a reduction of 10 points per day (24 hours). Students may not be penalized for absences due to participation in University-approved activities, including athletic or scholastics teams, musical and theatrical performances, and debate activities.

Make-up policy for tests

Exams will be given only at the scheduled times and places unless previous arrangements have been made no less than one (1) full week in advance. No one is exempt from exams. Makeup tests are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student from participating in the exam. Makeup exams should be administered and proctored by department personnel unless there are other pre-approved arrangements.

Incomplete grade policy

Incomplete grades are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.

Policy on the Recording of Lectures

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/

Student Support Services and Online Resources

- Center for Learning and Student Success (CLASS)
- Counseling and Psychological Services (CAPS)
- FAU Libraries
- Math Learning Center
- Office of Information Technology Helpdesk
- Office of International Programs and Study Abroad
- Office of Undergraduate Research and Inquiry (OURI)
- Science Learning Center
- Speaking Center
- Student Accessibility Services
- Student Athlete Success Center (SASC)
- Testing and Certification
- Test Preparation
- University Academic Advising Services
- University Center for Excellence in Writing (UCEW)
- Writing Across the Curriculum (WAC)

Course Topical Outline

1. Introduction
    - Plain and reinforced masonry
    - Design method
    - Load combinations

2. Masonry units
    - Application of masonry units in construction
    - Clay and concrete masonry units
3. Materials of masonry construction
    - Mortar and grout
    - Compressive strength of masonry
    - Steel reinforcement
4. Design of reinforced masonry beams
    - Analysis of rectangular sections in flexure
    - Modulus of rupture and nominal cracking moments
    - Fleural design of beams
5. Design for shear in reinforced masonry beams
    - Nominal shear strength of reinforced masonry
    - Determination of shear reinforcement for masonry beams
6. Lintels
    - Design considerations
    - Analysis of loads on lintels
7. Columns
    - Analysis of reinforced masonry columns
    - design procedure for reinforced masonry columns