FLORIDA POLYTECHNIC UNIVERSITY

Syllabus: CGN3023L Structures and Materials Lab

Course Information

- **Course Number and Title**: CGN3023L Structures and Materials Lab
- **Credit Hours:** 3
- **Academic Term:** Spring 2026

Instructor Information

- **Instructor:** Dr. Guven Kiymaz
- **Office Location:** GWEC 1021
- **Office Hours**: In-person or by appointment
- **Email address**: gkiymaz@floridapoly.edu

Course Delivery and Course Description

- **Delivery Mode**: In-Person.
- **Course Website**: https://catalog.floridapoly.edu/preview_program.php?catoid=35&poid=1595
- **Official Catalog Course Description**:

  The course is hands-on, design-centered, and immerses students in the practical and creative aspects of structural engineering. Through a series of studio-style projects, students design, build, and test physical models of buildings, bridges, and structural components using balsa wood members, plates, and other lightweight materials. The course emphasizes understanding structural behavior through direct experimentation, including testing under static loads, dynamic excitation, and simulated seismic forces. Students will learn how to conceptualize and evaluate different structural systems, explore material properties and load paths, and apply fundamental structural design principles to small-scale models. A major component of the course involves preparing for and participating in a seismic design competition. Students will follow the official competition rules from the previous year to design and construct a mock-up structure, analyze its expected performance, and test the final model on a shake table or an equivalent dynamic setup. In addition to hands-on activities, the studio integrates theoretical topics such as structural system selection, gravity- and lateral-load-resisting mechanisms, material behavior, stability considerations, and design decision-making in professional practice. By engaging in iterative design, prototyping, testing, and refinement, students develop engineering intuition, teamwork, communication skills, and a deeper appreciation for the interplay between analysis and physical behavior.

- **Course Pre-Requisites**: CES3102 Structural Analysis
- **Communication/Computation Skills Requirement (6A-10.030):** None
- **Required Texts and Materials:**
  Instructor's Lecture Notes

Course Objectives and Outcomes

- **Course Objectives**:
  - Develop hands-on understanding of structural behavior by designing, constructing, and testing physical models under static and dynamic loading.
  - Explore fundamental concepts of structural systems and material behavior, including load paths, stability, stiffness, strength, and deformation patterns.
  - Engage in iterative engineering design, incorporating creativity, analysis, prototyping, and performance testing to refine structural concepts.
  - Prepare for participation in seismic design competitions, learning to interpret competition rules, develop compliant designs, and execute physical shake-table testing.
  - Integrate theoretical structural engineering principles with practical model-scale construction, bridging the gap between classroom learning and real-world engineering applications.
  - Strengthen teamwork, project management, and technical communication skills through collaborative studio activities, presentations, and design documentation.
  - Develop engineering intuition and problem-solving skills by observing real structural behavior, failure modes, and system-level interactions in tested models.

- **Course Learning Outcomes**:
  Students will be able to demonstrate the ability to do the following:
  - **Explain** key structural engineering concepts—including load distribution, stiffness, stability, and material behavior—as they relate to small-scale physical models.
  - **Design** model-scale structures (e.g., buildings, bridges, frames) using balsa wood and similar materials, applying appropriate structural systems and load-resisting mechanisms.
  - **Construct** accurate and stable physical prototypes using model-building techniques, detailing, and careful material selection.
  - **Test** and evaluate structural performance under static, dynamic, and seismic loading, using laboratory equipment such as load frames, shake tables, or vibration devices.
  - **Analyze** test results to identify failure mechanisms, assess structural performance, and compare observed behavior with predicted response.
  - **Apply** official seismic design competition rules to create a compliant mock-up structure and demonstrate its performance in a realistic dynamic test environment.
  - **Use** basic structural analysis tools (manual or computational) to estimate forces, stresses, deflections, and dynamic characteristics of model structures.

- Alignment with Program Outcomes:

Student Outcomes
Upon completion of the Civil Engineering Degree, students will possess:
1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*

2. 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
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.
- **Peer Learning Strategists (PLS)**: Are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. Students can meet with a PLS in The Learning Center, which is located on the first floor of the Innovation, Science and Technology (IST) building in room 1019.
- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapoly.edu/writingcenter.

Civility and Collegiality (optional statement)

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. Communication, written, oral and behavioral, between faculty and students must remain respectful. Within and outside of the classroom, students must refrain from derogatory comments toward the faculty member and their fellow students, and faculty as well must refrain from derogatory comments toward their students. Faculty and students should address each other with respect, in accordance with the wishes of the faculty and the students: for example, no one should be addressed by their last name alone.

Faculty from the outset of a course can and should specify what constitutes activities and behavior that take away from, that diminish, the educational environment. An individual student's distracting behavior impedes the education of fellow students, which itself is a form of disrespect. Civility and collegiality also include respecting each other's time: for example, neither students nor faculty should arrive late to class (unless unforeseen, pressing circumstances prevail); faculty should be present at the posted office hours; and students and faculty should be punctual when meeting times are scheduled. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

Course Policies

Attendance

- Students in **face-to-face (this includes labs and C-courses)** courses are expected "to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor" (University Policy, FPU-5.0010AP).
- *A+ Attendance* will be used to track attendance or traditional roll call per preference of instructor.
- Students are expected to regularly attend class and are responsible for notes, homework assignments, projects, laboratories, and any exams/quizzes missed if absent. Medical or family emergencies need to be communicated to the instructor as soon as possible, preferably before assignments or exams are due.
- Note: Falsifying attendance for yourself or for another student is an act of academic dishonesty and is considered a violation of the university's academic integrity policy.

Participation

Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). In addition, students who routinely do not bring materials to class that are required for participation, will not be given credit for class attendance, and if this becomes a pattern of behavior, may be asked to leave the class for the day. Persistent problems with participation may result in a code of conduct referral.

Late Work/Make-up work

- A LATE PENALTY of 10% will be assessed for assignments turned in after the deadline. The Assignment in Canvas will stay open until 11:59 PM of the following day should the 'due date' be missed.
- ALL HOMEWORK AND PROJECT DELIVERABLES MUST BE TURNED IN AND POSTED IN CANVAS ASSIGNMENTS TO EARN CREDIT AND RECEIVE A GRADE. IF THE ASSIGNMENT IS NOT POSTED IN CANVAS, A ZERO WILL BE RECORDED FOR THAT ASSIGNMENT.
- Should you have extenuating circumstances, CONTACT YOUR INSTRUCTOR. Your instructor will work with you and others, as needed, in the university community to make the appropriate adjustments. They may, at their discretion, accept a 'past due' assignment, however, YOU must email your instructor and ask them to open the Canvas assignment for you. The instructor retains the right to ask for documentation of your 'extenuating circumstance' before they reopen the assignment. The Canvas Assignment will remain open for 24 hours, after the request has been accepted with a confirmation email from the instructor to the student.

Grading Scale

- Grades for will be posted to Canvas for reference only, and students should make sure they are recorded correctly. However, there is no guarantee that the percentages or projected grades provided there are correct. The instructor will calculate final percentages and will determine final grades regardless of Canvas calculations.

A	≥93%	B+	≥87%	C+	≥77%	C-	≥70%
A-	≥90%	B	≥83%	C	≥73%	D	≥60%
		B-	≥80%			F	< 60%

Assignment/Evaluation Methods

- All assignments should be turned in by the due date. Homework will be assigned after every class and is due on Canvas per the specified due date. Usually, you will have one week to complete homework assignments. Be sure check your Assignments in Canvas, and set your reminders as necessary, for the dates and times that correspond your class period. Homework will usually be submitted electronically as a Word/PDF file on Canvas.
- It is the student's responsible for planning their schedules accordingly and ensuring sufficient time to complete the weekly tasks.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive.
If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863) 874-8770
The Access Point
ODS website: www.floridapoly.edy/disability

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discussion resources and options available.

Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly

degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Any "special" instructions that are appropriate for academic integrity and the course should go here.
(It is essential that a heading and a statement on what constitutes, includes, academic integrity be included in the syllabus, and that the students be made aware of academic integrity at the beginning of a course.)

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidently, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is ***prohibited****.*

Course Schedule

Meeting #	Class Date	Lecture Topic / Notes
1	Monday, January 12, 2026	Structures - Introduction
2	Wednesday, January 14, 2026	General Types of Structures - Primary Classification
3	Friday, January 16, 2026	General Types of Structures - Primary Classification
4	**Monday, January 19, 2026**	**No Classes (Martin Luther King Jr. Holiday)**
5	Wednesday, January 21, 2026	General Types of Structures - Primary Structural Elements
6	Friday, January 23, 2026	General Types of Structures - Primary Structural Elements
7	Monday, January 26, 2026	Introduction to Structural Analysis and Design
8	Wednesday, January 28, 2026	Analysis and Design of Structures - Basic Issues
9	Friday, January 30, 2026	Introduction to SAP2000
10	Monday, February 2, 2026	Load Path and Horizontal Spanning Systems
11	Wednesday, February 4, 2026	Load Path and Horizontal Spanning Systems
12	Friday, February 6, 2026	Construction Technologies
13	Monday, February 9, 2026	Construction Technologies
14	Wednesday, February 11, 2026	Construction Technologies
15	Friday, February 13, 2026	Millenium Bridge
16	Monday, February 16, 2026	Millenium Bridge
17	Wednesday, February 18, 2026	Canyon Bridge
18	Friday, February 20, 2026	Canyon Bridge
19	Monday, February 23, 2026	Skybridge
20	Wednesday, February 25, 2026	Skybridge
21	Friday, February 27, 2026	Lab activity - Practice model structure
22	Monday, March 2, 2026	Building Model_Tribitary Area
23	Wednesday, March 4, 2026	Building Model_Tribitary Area
24	Friday, March 6, 2026	Building Model_Tribitary Area

25	Monday, March 9, 2026	Balsa Bridge Competition
26	Wednesday, March 11, 2026	Balsa Bridge Competition
27	Friday, March 13, 2026	Balsa Bridge Competition
28	Monday, March 16, 2026	**No Classes (Spring Break)**
29	Wednesday, March 18, 2026	**No Classes (Spring Break)**
30	Friday, March 20, 2026	**No Classes (Spring Break)**
31	Monday, March 23, 2026	Balsa Bridge Competition
32	Wednesday, March 25, 2026	Seismic Design Competition
33	Friday, March 27, 2026	Seismic Design Competition
34	Monday, March 30, 2026	Seismic Design Competition
35	Wednesday, April 1, 2026	Seismic Design Competition
36	Friday, April 3, 2026	Seismic Design Competition
37	Monday, April 6, 2026	Seismic Design Competition
38	Wednesday, April 8, 2026	Seismic Design Competition
39	Friday, April 10, 2026	Seismic Design Competition
40	Monday, April 13, 2026	Seismic Design Competition
41	Wednesday, April 15, 2026	Seismic Design Competition
42	Friday, April 17, 2026	Submission of FABI Report
43	**Monday, April 20, 2026**	**AISC Conference**
44	**Wednesday, April 22, 2026**	**AISC Conference**
45	**Friday, April 24, 2026**	**AISC Conference**
46	**Monday, April 27, 2026**	**AISC Conference**