A. GENERAL
1. Course: Architecture 213b, 3 units, Harris101, Tu/Th, 12:30
2. Title: Structure Systems and Seismic Design
3. Class meetings: Two 1.5 hour lectures and one 1 hour lab per week
4. Examinations: Quizzes, Midterm and Final Exam
5. Student hours: 9 hours per week, including class and lab time

B. OBJECTIVES
Develop understanding of building structures and selection criteria for appropriate systems; integration of structures with architectural objectives; conceptual design of structures for gravity and lateral wind and seismic loads. Ability to demonstrate the basic principles of structural systems and their ability to withstand gravitational and lateral wind and seismic forces, as well as the selection and application of the appropriate structural system.

C. SUBJECT MATTER
Structural systems to resist gravity and lateral loads. Integration architectural and structural objectives for synergy of form and structure. Selection of systems for diverse objectives. Potential of structures to define space, serve as ordering system, provide texture and tectonics. The USC School of Architecture’s five year BARCH degree and the two year M.ARCH degree are accredited professional architectural degree programs. All students can access and review the NAAB Conditions of Accreditation (including the Student Performance Criteria) on the NAAB Website: http://www.naab.org/accreditation/home

D. ASSIGNMENTS
Readings, homework, quizzes, term projects, Mid Term and Final Exam.

E. BASIS FOR COURSE GRADE
Subject: percentage of grade
Term projects: ~23%
Homework, exercise, etc.: ~31%
Mid Term: ~23%
Final Exam: ~23%
Total: 100%
Grading scale:
A = 90 -100%
B = 80 - 90%
C = 70 - 80%
D = 60 - 70%
To pass the course students must pass the Final and miss not more then two classes

F. Academic Conduct
Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity, http://equity.usc.edu or to the Department of Public Safety, http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men provides 24/7 confidential support, and the sexual assault resource center describes reporting options and other resources. Diversity and Inclusion is covered at: https://diversity.usc.edu/

G. Support Systems
A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute, http://dornsife.usc.edu/ail, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs (306 Watt Way, 213-740-0776) provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information, http://emergency.usc.edu will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

H. Resource books
Schierle (1968) Lightweight Tension Structures, UCB.
Schierle (1970) Prestressed Trusses [USC ARCH library]
Schueller (1983) Horizontal Span Structures, Wiley

I. COURSE OUTLINE

JANUARY
Tu 08 Introduction: synergy of form and structure Term Project issued
Th 10 Selection of structure systems Read chapter 10
Tu 15 Seismic design, tsunami Read chapter 9
Th 17 Design for wind, wind storms Read chapter 9
Tu 22 Horizontal structures introduction Read chapter 11
Th 24 Design of tensile structures Read chapter 14
Tu 29 Design of suspended structures Read pages 318-323
Th 31 Design of arch and vault structures Read pages 272-284

FEBRUARY
Tu 05 Fabric structure design Read pages 330-352
Th 07 Joist beam and frame structure design Read chapter 11
Tu 12 Truss structure design Read chapter 12
Th 14 Cable truss design Read pages 324-329
Tu 19 Stayed structure design Read pages 310-317
Th 21 Vierendeel structure design Read pages 229-234
Tu 26 Shell structure design Read pages 235-243 & 285-307
Th 28 Folded plates and cylindrical shell design Read pages 235-243

MARCH
Tu 05 Wood structures Read chapter 20
Th 07 Term project review, 12:30 – 4:20 pm Read pages 209-214
11-16 SPRING BREAK
Tu 19 Foundation design Read pages 534-536
Th 21 Midterm review
Tu 26 SDG: Structure Design Graph Review SDG tutorial
Th 28 Midterm Exam

APRIL
Th 02 Introduction of vertical/lateral structures Read chapter 15
Tu 04 Portal Method Read pages 201-202
Tu 09 Moment frame design Read chapter 11 & pages 203-204
Th 11 Braced frame & framed tube design Read pages 205-206
Tu 16 Shear wall design Read chapter 16
Th 18 Final review

May
We 08 Final Exam, 2 to 4 pm, Harris 101