1. CEE 4700 (5700) – Masonry Design

2. Course credit hours: 3
   Contact hours per week: 4
   Credit category: Engineering Topics (Significant Design)

3. Course coordinator: R. Craig Henderson

4. Textbook: TMS 402 – Building Code Requirements for Masonry Structures

   Supplemental materials: Taly, *Design of Reinforced Masonry Structures, McGraw-Hill, latest edition*

5. Course information:

2020 Catalog description	Masonry materials and construction. Design of masonry beams, walls, and columns. Seismic design of masonry structures.
Prerequisite(s)	CEE 3030 and CEE 4320
Course type	Selected Elective

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Understand test methods for masonry components	1
CO2	Understand masonry terminology and be able to converse in written and oral format about testing, analysis, design, and construction	1
CO3	Understand the principles of masonry construction and typical configurations of masonry buildings and sub-assemblies	1
CO4	Analyze and design typical masonry elements including columns, beams, lintels, and walls to resist structural forces	1, 2

   ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
3.2	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

7. Course topics:

   1. Masonry materials, ASTM testing, and TMS code (8 %)
   2. Masonry construction (7 %)
   3. Flexural behavior and design of beams (15 %)
   4. Shear behavior and design of beams (10 %)

5. Flexural and axial design of load bearing walls (12 %)
6. Design of shear walls (13 %)
7. Design of masonry columns and pilasters (15 %)
8. Seismic design of masonry buildings (20 %)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science
2. Analyze and solve problems in at least four technical areas appropriate to civil engineering
3. Design a system, component, or process in at least two civil engineering contexts

8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:
   Graduate students in masonry are required to pursue the above topics in more depth, often automating the design process using programs like MathCad, Excel, Visual BASIC, etc.

9. Date: 01/20/2020