**Seismic Resistant Design of Steel Structures**

**Design Project (Assignment #2)** **Due: 5/28/2018**

**Late submission will not be accepted.**

Properly use the ETABS program:

（1）Assume the average steel weight (including girders, beams, columns, braces, the gravity and lateral load resisting systems) in each floor is 100 kg/$m^2$. Based on this and other weights on the floor or of the wall, please compute the mass and mass moment of inertia for computation of the vibration periods.

（2）Neglect the static gravity dead and live load effects at this stage, conduct the preliminary design and construct the 3D analytical model. Use same column and beam member sizes for every two stories or floors. Check and assure lateral displacement under the seismic loads comply with the code prescribed story drift limit of 0.005 radian. Modify and repeat your design or analysis to find the suitable design.

（3）When you work on Item (2), you should consider the capacity design of the force controlled elements in the, MRF, EBF or BRBF. When you change the structural members in your analytical model, you should also pay attention to its effects on the change of vibration periods. You may need to revise the seismic design forces in two directions according to the building code requirements.

（4）Submit a report not exceeding 15 pages. Report your design, including:

a. Show all member sizes in your lateral force resisting system using suitable frame elevations.
b. Vibration periods of your structure (first six modes)
c. The code prescribed base shear and seismic lateral forces in each floor in two directions
d. The inter-story drift distributions in the two directions
e. Average steel weight of the lateral force resisting system for each floor.

（5）In your analytical model, assume no rigid end zone offset and use center-to-center line dimensions. Column base is assumed fixed on the ground.

（6）Optional: you may want to construct a PISA3D model to check the vibration periods after you have completed the ETABS analysis.

（7）Keep a copy for your reference.