Department: Civil & Environmental Engineering   **Division: Civil engineering**
Level and Major: Graduate - Geotechnical Engineering

Course Title: soil dynamics   **Number of Credits: 3**
Prerequisite (Corequisite): Structural analysis (I)**,** Concrete Technology   **Lecturer: -**

Course Topic

- Introduction: usage of soil dynamics in civil engineering issues, the nature electrical load and its types
- A review of earthquake engineering, earthquake and its aftermath (landslide, liquefaction and etc.), earthquake factors, general information about the earthquake in Iran, types of seismic waves caused by earthquakes, earth movements how to record it, features of earthquakes (magnitude center, intensity and etc.), acceleration reduction and speed (famous reduction relations),introducing the Fourier spectrum
- A look at the vibrations of one and multi-degree freedom systems :defining degrees of freedom, natural frequency and vibration intensifiaction of one degree of freedom system ,free vibration with and without damping , forced vibration with and without damping, vibration under intermittent and transient loads, types of soil damping (viscous damping and lineaer hysteresis ,multi-degree freedom systems , free vibration of two-degrees freedom system –(couple, uncouple)…with and without damping, forced vibration of two –degrees freedom system-couple and uncouple-with and without damping
- One-dimensional wave propagation: equation of wave and its speed (body waves, shear, ba r and etc.)the behavior of the bar under the influence of free vibration and periodic force ,transient vibrations in the elastic bar (homogeneous and non-homogeneous bar)radiation damping , uniform and layered foundation under the influence of periodic basic movements , the effect oft he site in one-dimensional mode(reinforcement of maximum acceleration , the temporal shape ,the response of soft sites to small accelerations o fbedrock and etc(...
- Two and three –dimensional wave propagation ,spherical waves and Riley waves reflection and refraction at the borders, surface waves in the layered environment a brief overview of the effect of topography on earthquake waves and the two and three-dimensional effect of the valley
- Dynamic features of soils : how to estimate shear wave velocity and shear modulus based on laboratory tests , field tests introduce a number of experimental relations to calculate the maximum shear modulus, experimental relations calculate the changes in the ratio o fshear modulus and dampling wit hshear strai,nthe effec to fdifferent soil parameters on shear modulus

Course Description:
Reading Sources:
Course Goals and objectives:
Evaluation:
Course topics:
The course aims to: