TEACHING ACTIVITIES

UNDERGRADUATE TEACHING[1]

1. **Descriptive Geometry (Technion) (10)** 1965-1968
   Principles of space geometry, projections, plane and space representation of regular objects, intersections, shading principles, isometry and perspective.
2. **Structural Analysis (Technion) (30)** 1978-1979
   Basic equilibrium under static loads, internal stress resultant distribution, beams, trusses, virtual work methods, influence lines, moment distributions, slope deflection, matrix methods.
3. **Experimental Mechanics (Technion (30)** 1977-1979
   Hands on experiments on material testing (tension, compression, shear), photoelasticity, strain gages, analog computers, structural vibrations.
4. **Design of Structural Systems (Technion) (30)** 1978-1979
   Definition of systems, planar and space tubular structures, shells, folded plates, precast systems, blast protective systems.
5. **Numerical Methods SUNY/Buffalo (EAS 451) (100)** 1980-1984[2]
   Matrix analysis, transformations, eigenvalues, nonlinear equations, numerical integration, differentiation, error analysis, nonlinear differential equations, partial differential equations, curve fitting, introduction to optimization.
6. **Engineering Mechanics (SUNY/Buffalo EAS205 & EAS206) (30)** 1981-1982
   Principles of equilibrium, dynamics, vectorial motion, structural members, stress - strain constitutive laws, stress-strain tensors, transformations, stress resultants introduction to design of simple mechanical components.
7. **Structural Analysis & Design (SUNY/Buffalo CIE323 and CIE324) (30)** 1982-1983
   Basic equilibrium under static loads, internal stress resultant distribution, beams, trusses, virtual work methods, influence lines, moment distributions, slope deflection, matrix methods, basic design of steel and reinforced concrete members, shear and torsion analysis. 2006
8. **Reinforced Concrete Analysis and Design (SUNY/Buffalo CIE429) (55)**[3] 1984-2005
   Design of concrete buildings- sections, beams, slabs, columns, footings including shear, torsion, axial-bending interactions - system approach. Introduction to basic engineering sketching and drafting
9. **Structures Laboratory (SUNY/Buffalo CIE325) (10-80)**‡ 1985-1996
   Experiments or basic material testing and structural members, shear, torsion, indeterminate frames, arches, force measurements, introduction to modern measurement systems --electrical instrumentation, computer data acquisition.
10. **Computer Graphics (SUNY/Buffalo, CIE 460) (10)**‡ 1989-1992
    Basic X-Y plotting, spread-sheet interactive graphics ("QUATRO"), principle of engineering drawing-planes, lines, objects - "In-A-Vision", lettering-text superposition advanced graphics, curves, and curved surfaces ("Grapher"), Analysis of buildings ("Strand"), Basic graphics theory-using, translation, rotations, ("Hoops").
11. **Structural Analysis Advanced (SUNY/Buffalo CIE423)** [6] 2009-2012
    Virtual work methods, influence lines, moment distributions, slope deflection, matrix methods, approximate methods of analysis.

Go to List of Sections

GRADUATE TEACHING[4]

1. **Advanced Structural Dynamics (Technion) (8)** 1978-1979
   Second course in structural vibrations, nonlinear systems, energy principles Lagrange equations, Laplace and Fourier domain, probabilistic and statistical methods, computer analog simulations, approximate methods, Galerkin, Rayleigh, Ritz, etc.

[1] Numbers in parentheses show approximate class size per semester.
[2] Taught every semester i.e., twice a year.
[3] Courses newly developed or substantially changed.
[4] Numbers in parentheses show approximate class size per semester.

2. **Earthquake Engineering and Structural Dynamics (SUNY/Buffalo CIE619) (15)**‡ 1981-2002, 2009
   Advanced methods in structural dynamics - approximate methods (Rayleigh, Ritz, direct and subspace iterations, transfer matrix), probabilistic approaches and random processes, nonlinear dynamics. Introduction to seismology, ground motion, earthquake simulation, structure response, spectrum approach, concrete and steel structures design, frequency analysis, nondeterministic analysis.
3. **Advanced R/C and Prestress Concrete Design (SUNY/Buffalo CIE525) (15)** 1982-1988
   Analysis and design of prestress concrete (P/C) beams, frames, slabs, limit design of frame structures, ductility and hysteretic behavior. Yield line theories and plastic design of slabs; shells - circular and hypars.
4. **Experimental Mechanics (SUNY/Buffalo CIE616) (5)**‡ 1982-1991
   Hands on experiments on material testing (tension, compression, shear), photoelasticity, strain gages, analog computers, structural vibrations, in depth theory of instrumentation, vibration measurements and processing of vibration data - frequency analysis, filtering etc.
5. **Civil Engineering Seminar (SUNY/Buffalo CIE505B) (15)**‡ 1988-1995.
   Invited speakers in area of structures and geotechnical engineering speak about current topics of research which were partially solved and need discussions and further investigations. Invited lectures from local faculty and graduate students. Invited several speakers from other Universities in U.S. and abroad.
6. **Introduction to Computer Graphics (SUNY/Buffalo CIE501 - Special Topics) (8)**‡ 1988-1990[5]
   Newly developed course presents basic graphic representations using C-programming language, translations, rotations, Civil engineering substructures, beams, columns, footings; plotting in 2-D - 3D structures (Hoops environment); screen oriented interaction; interactive structural analysis (PREPF, STRAND, QUAND, IDARC) - [Developed in association with Professor J. Abel (Cornell Univ.), and Dr. S.K. Kunnath (SUNY/Buffalo)].
7. **Experimental Methods in Structural Engineering (SUNY CIE616 (12 avg)**[6] 1997,2002, 2004, 2007, 2008, 2010, 2011
   New course on experimental methods including design of experiments; scaled models, development and use of electronic instruments, data acquisition systems and advanced data processing.. Two-hour lecture and three-hour lab weekly.
8. **Dynamics of Structures (SUNY/Buffalo, CIE519) (20)** 1991-2001
   Introductory course to dynamics of single and multi-degree-of-freedom systems,
   Frequency domain approaches.

[5] Taught every semester i.e., twice a year.
[6] Courses newly developed or substantially changed.