Unified Engineering LP

3056 Weber Drive
Aurora, Illinois 60502

phone: 630/851–4214
fax: 630/851–5957

www.unified-eng.com

Mark A. Lawrence, Ph.D., P.E.

Engineering Mechanics & Reliability

Employment

1995-present	Principal, Unified Engineering
1992-1995	Director of Engineering Mechanics, Packer Engineering, Inc.
1990-1992	Manager of Engineering Mechanics, Packer Engineering, Inc.
1986-1989	Assistant Professor, Department of Mechanical Engineering, Northwestern University
1985-1986	Visiting Assistant Professor, Department of Mechanical and Nuclear Engineering, Northwestern University

Special courses taught

1991	Prestressed Concrete, Illinois Institute of Technology
1988	Mechanics of Structures, Zenith Electric Corporation through arrangement with Northwestern University

Education

1986	Ph.D. in Civil Engineering; University of Illinois at Urbana-Champaign (Thesis: *A Basis Random Variable Approach to Stochastic Structural Mechanics*)
1982	M.S. in Civil Engineering; University of Illinois at Urbana-Champaign
1981	B.S. in Civil Engineering; University of Illinois at Urbana-Champaign

Continuing education

2020	Industrial Building Design & Non-Building Structures; AISC
2020	The Basics of Steel Bridge Design Workshop; AISC
2020	Are You Properly Specifying Materials?; AISC
2019	Engineering Practice for Wetting-Induced Collapse of Soils; ASCE
2019	Introduction to Unsaturated Soil Mechanics; ASCE
2019	Diagnosis, Repair, and Restoration of Building Facades; ASCE
2019	Practical Applications of Fiber Reinforced Polymer in Strengthening Existing Concrete and Masonry Structures; ASCE
2019	Deflection Calculation of Concrete Floors; ASCE
2019	Blast Protection of Buildings; ASCE
2019	Design of Wood Beams and Joists; ASCE
2019	Practical Nonlinear Modeling and Analysis of Buildings; ASCE
2018	Column Design: Past, Present, Future; AISC
2018	Steel Construction: Mill to Topping Out; AISC
2018	Tarrifs and Trade Issues; AISC

2017	Antiquated Structural Systems; ASCE
2017	How to Review a Lift Plan; ASCE
2017	Fundamentals of Stability; AISC
2016	The Concrete Repair Code; ACI
2016	Steel Design 2: Selected Topics; AISC
2016	History of AISC Specification for Structural Steel Buildings; AISC
2015	Steel Design After College; AISC
2015	Bolting and Welding Primer; AISC
2014	Classical Methods of Structural Analysis; AISC
2013	Metallurgy of Welding and Joining; ASM International
2011	Mechanical Testing of Metals; ASM International
2009	Corrosion; ASM International
2006	Advanced C++ Programming; College of DuPage
2004	C++ Programming Language; College of DuPage
1999	Fractography; ASM International
1998	Fracture & Fatigue Control in Structures; University of Kansas
1996	Wind Loads for Buildings and Other Structures; ASCE
1996	OSHA 10-Hour Course; Chicagoland Construction Safety Council
1994	Introduction to ANSYS; Swanson Service Corporation
1991	Application of Engineering Fracture Mechanics; Texas A & M University
1990	Cords, Strands, Cables, and Wire Rope: Recent Developments and Applications; University of Illinois

Professional licenses and registrations

Professional Engineer, State of Illinois license number 062-048382
Professional Engineer, State of Ohio license number 79320

Professional societies

American Society of Civil Engineers
American Society of Mechanical Engineers
American Statistical Association
American Institute of Steel Construction
American Welding Society
American Concrete Institute

Awards

1988-1989	National Science Foundation Research Initiation Award
1987	Finalist, Apple Computer's Aerospace Software Competition
1982-1985	Exxon Fellowship in Civil Engineering
1981-1982	University of Illinois Fellowship
1981	University of Illinois Bronze Tablet, University Honors

Selected publications

"A Finite Element Solution Technique for Plates of Random Thickness," Chapter 9 in *Finite Element Methods for Plate and Shell Structures* (T.J.R. Hughes and E. Hinton, eds.), Pineridge Press, Ltd., Swansea, UK, 1986.

"Basis Random Variables In Finite Element Analysis," *International Journal of Numerical Methods in Engineering*, vol. 24, no. 10, October 1987, John Wiley & Sons

"Probability-Based Tools for Interactive Computer-Aided Design," *Computational Probabilistic Methods* (W.K. Liu, T. Belytschko, M.A. Lawrence, and T. Cruse, eds), ASME Publication AMD-Vol. 93, 1988, pp. 37-48

"An Introduction to Reliability Methods," Chapter 1 of *Computational Mechanics of Probabilistic and Reliability Analysis* (W.K. Liu and T. Belytschko, eds), Elmepress International, Lausanne, Switzerland, 1989, pp. 10-45

"Brittle Fracture Reliability by Probabilistic Finite Elements," (with G.H. Besterfield, W.K. Liu, and T.B. Belytschko) Chapter 15 of *Computational Mechanics of Probabilistic and Reliability Analysis* (W.K. Liu and T. Belytschko, eds), Elmepress International, Lausanne, Switzerland, 1989, pp. 326-342

"Fatigue Crack Growth Reliability by Probabilistic Finite Elements," (with G.H. Besterfield, W.K. Liu, and T.B. Belytschko) Chapter 16 of *Computational Mechanics of Probabilistic and Reliability Analysis* (W.K. Liu and T. Belytschko, eds), Elmepress International, Lausanne, Switzerland, 1989, pp. 344-369

"Brittle Fracture Reliability by Probabilistic Finite Elements," (with G.H. Besterfield, W.K. Liu, and T. Belytschko), *Journal of Engineering Mechanics*, vol. 116, no. 3, March 1990, ASCE, pp 642-659

"Fatigue Crack Growth Reliability," (with W.K. Liu, G.H. Besterfield, and T. Belytschko), *Journal of Engineering Mechanics*, vol. 116, no. 3, March 1990, ASCE, pp 698-708

"Fatigue Crack Growth Reliability by Probabilistic Finite Elements," (with G.H. Besterfield, W.K. Liu, and T. Belytschko), *Computer Methods in Applied Mechanics and Engineering*, 1991, pp 297-320

"Use and Abuse of Probabilistic Methods," presented at SAE International Off-Highway & Powerplant Congress & Exposition, 1992