



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

- 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 Institute of Steel Construction
 American Welding Society
 ASM International
 American Statistical Association
 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), Elmeppress 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