



Professor Nils Otto Myklestad (1909-1972)

See:

https://en.wikipedia.org/wiki/Nils_Otto_Myklestad

Short Biography (from Wikipedia):

Nils Otto Myklestad (March 24, 1909 – September 23, 1972) was an American mechanical engineer and engineering professor. An authority on mechanical vibration, he was employed by a number of important US engineering firms and served on the faculty of several major engineering universities. Myklestad made significant contributions to both engineering practice and engineering education, publishing a number of widely influential technical journal papers and textbooks. He also was granted five US patents during his career.

Myklestad was employed in various technical capacities by AiResearch, North American Aviation, Westinghouse Electric, Fairbanks Morse, and Bell Helicopter Company. He served on the faculties of California Institute of Technology, University of California, Cornell University, Illinois Institute of Technology, University of Illinois, Arizona State University and the University of Texas at Arlington. He was elected fellow of the American Society of Mechanical Engineers (ASME) in 1967 and fellow of the American Association for the Advancement of Science (AAAS) in 1969.

Work at Guggenheim Aeronautical Laboratory, California Institute of Technology (from Wikipedia):

From 1942 to 1945 he was the Research Associate in charge of Vibration and Flutter, Guggenheim Aeronautical Laboratory, California Institute of Technology. It was during this time that he made a number of significant contributions to the theory and practice of engineering. In 1944, he published “A New Method of Calculating Natural Modes of Uncoupled Bending Vibration of Airplane Wings and Other Types of Beams”. An efficient numerical method for finding the undamped natural frequencies and mode shapes of structures

modeled with numerous beam and inertia elements, the tabular procedure became known as the Myklestad Method. This approach while more complex, is similar to methods developed earlier for torsional systems, and in the introductory sections of Myklestad's article the path-finding work of Heinrich Holzer is credited. In 1945, a similar numerical method was published by M. A. Prohl, "A General Method for Calculating Critical Speeds of Flexible Rotors". As a consequence the method is also often called the Myklestad-Prohl method or Prohl-Myklestad method.

In any event, the practical importance of the Myklestad Method established a worldwide reputation for its author and has been, and continues to be to this day, widely used for calculation of natural frequencies and normal modes of rotating and nonrotating beam structures. The method has been used in many different applications including vibration analysis of airplane wings and fuselages, helicopter rotor blades, wind turbine blades, naval ship hulls, and rocket powered launch vehicles. When matrix methods became popular, the Myklestad Method was recast into what became known as the transfer matrix method.

During the time he was employed at the Guggenheim Aeronautical Laboratory, he extended the Myklestad Method to include coupled bending-torsion vibration and also developed one of the first efficient and numerically accurate methods of calculating the flutter speed of a multi-mass airplane wing model. This approach was used in the flutter analysis of both the B-36 bomber and the Hughes Aircraft Spruce Goose flying boat (Hughes H-4 Hercules). During this highly productive period he also published the first version of his popular book, *Vibration Analysis*.

Work in Industry & Academia, 1947 – 1972 (from Wikipedia):

In 1947 Nils Myklestad accepted a position as Professor of Theoretical and Applied Mechanics at the University of Illinois where he supervised a number of master's theses and PhD dissertations. He then joined North American Aviation in 1952 where he was in charge of the Navajo Missile Program. From 1954 until 1955 he was Chief of the Systems Analysis Section of Aerophysics Development Company. Myklestad joined AiResearch Manufacturing Company of Arizona in 1955 where he remained as Research Project Engineer until 1961 when he accepted a position as Professor of Engineering at Arizona State University. In 1967 he joined the University of Texas at Arlington as a Professor of Engineering Mechanics. While living in Arlington, TX he also served as a consultant to Bell Helicopter.

The author of a number of significant technical articles, he also published four important textbooks on engineering mechanics. The most widely known of these are his books on vibration analysis, first published by McGraw-Hill in 1944 as *Vibration Analysis* and revised as *Fundamentals of Vibration Analysis* in 1956. By using Cartesian tensor notation in his last three books, *Engineering Mechanics*, *Statics of Deformable Bodies*, and *Cartesian Tensors*, Myklestad became an early proponent of tensor analysis in the undergraduate engineering curriculum. During his varied and productive career he also received five US patents.

Nils O. Myklestad died in 1972 at age 63 while serving as Professor of Aerospace Engineering and Engineering Mechanics at the University of Texas at Arlington.

In 1991 The American Society of Mechanical Engineers, ASME, honored this prolific engineer by establishing the N.O. Myklestad Award presented every two years in recognition of a major innovative contribution to vibration engineering.

Selected Publications:

See https://en.wikipedia.org/wiki/Nils_Otto_Myklestad for a list.