

# DEVELOPING STUDENT INTEREST IN DESIGN

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**Abstract:** - During the past few years, asking a physician or engineer how they chose their field of expertise yielded some interesting answers. These answers led to an earlier paper which discussed an academic program developed to enhance students' interest in fatigue and failure analysis in engineering design. The next step in this effort is to further develop the program to provide students a strong introduction to optimization in design. At Kettering, the mechanical engineering program consists of the standard core courses (statics, dynamics, solid mechanics, machine design., thermodynamics, fluid mechanics, heat transfer, dynamic systems, etc.) The core courses are then followed by specialty courses. In the case of the fatigue/failure, courses include advanced machine design, failure analysis, and fatigue considerations in design. A capstone course is also involved; which may or may not be involved with failure analysis. The failure analysis course itself could serve as a capstone project; but, does not (topic for another discussion.) Students work with a company or individual whose part has failed; to investigate the failure, determine the cause of the failure, and propose corrective action. The proposed optimization thread would include the advanced machine design course, plus, a true design course, an optimization course, electives, and a capstone project course related strictly to design and optimization. One consideration for the capstone project is use the projects from the failure analysis course and optimize the design. GENESIS would be coupled via VisualDOC and a boundary element code such as BEASY.

Professor Dippery recently retired from Kettering University after 22 years teaching courses in solid mechanics and fatigue considerations in design. Prior to that, he worked in industry for more than 30 years as a design and analytical engineer with GE aircraft engine and gas turbines, Westinghouse nuclear operations, and a maintenance engineer in the electric utility industry. He earned his bachelors, masters, and doctorate degrees from the University of Cincinnati.