

THE PRACTICE ORIENTED MASTERS DEGREE: THE NEW FRONTIER OF ENGINEERING EDUCATION

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ABSTRACT - Graduate study in engineering in the US has taken several forms over the past several decades largely in response to federal priorities for applied research and the need of industry for skilled technologists who can work at the cutting edge of new product and process development. The tradition that study at the master's level implies a bit more focus in a technical area and a strengthening of the student's skill set has thus given way to utilitarian goals. The former educational framework developed during the period when graduate study was aimed primarily at the production of doctoral degrees and when federal funds for university research dramatically expanded in the wake of the Second World War. Today, employers of engineers need skills sets to move with the pace of technological change and have motivated the educational innovation that is seen in many of the professional masters degree programs currently being offered. This paper surveys the wide range of professional masters degree programs in the US engineering schools and draws comparisons among them in terms of professional intent, educational structure, and value added. We also provide some data on the extent to which industry-based graduate continuing education programs and to what degree they provide synergism and competition with university-based continuing education programs. We also describe a generic kind of professional masters degree program for engineering that hopefully will serve as a model of the kind of education that will be come the norm for US engineering schools over the next generation. Such a degree program has antecedents at the University of Maryland Baltimore County and at the University of Minnesota, although features of it can be found in several already successful masters programs. The primary features the proposed program are the requirement of trans-disciplinary study that bridges broad technology and policy sectors, extensive use of digital delivery technologies, and resource sharing between educational institutions. The paper develops a model curriculum and applies it to our institution by way of examples that use current faculty and curricular resources. We conclude with a discussion of cost factors and implementation strategies that may be used either within a national educational system or across national boundaries. While not our primary objective, the latter could imply the development of a virtual university model.

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