

The Importance of Materials Science Education in Mechanical Engineering

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Mechanical Engineering requires a robust course(s) in Materials Science since it deals with energy as well as mechanical systems. As we had demonstrated in early sixties the lack of appropriate materials for power generation in space, current energy systems also lack the most appropriate materials for acceptable levels of efficiency, such as in gas and steam turbine blades, photovoltaics and fuel cells. With the development of nano-mechanics, we had hoped that materials on demand and in the form that they could be used would have been developed. So far this has not proven to be the case. As a mechanical engineer, we have very specific requirements to accomplish our design and products. The availability of such materials is very important for the user of the design. These facts make it very desirable to have the appropriate lectures, courses and textbooks for the undergraduate student. We have to make sure that we can excite them so that they pursue graduate work where they design, build and create new systems. In order to achieve this excitement in the student, we must use the best available textbooks, create experiences in well-developed laboratories and permit creativity even if the initial try fails. We must teach them to learn by their mistakes and support them in their search for creative ways of doing designs.

In all institutions that I have been associated with, I have pushed for as many hours as the curriculum would permit to add course(s) in materials science. It does not take much to appreciate the fact that without the appropriate materials, our designs are also not very good. If we could just have the materials for gas-steam turbine blades that could withstand ten-twenty-thirty degrees more, the overall efficiencies will increase thus preserving the fuel resources. For future generations this is a must. Investment in research and development is a must. Government spending on research is a must. Creative design of products is a must. Meaningful teaching/research is a must. We do have challenges ahead of us!

Biography:

Dr. Ozer Arnas was educated at Robert College-Istanbul, BSME 1958, Duke University, MSME and North Carolina State University, PhD. He started his academic career at Louisiana State University, 1962, where he is now a Professor Emeritus, 1985. He also taught at the California State University System, 1986-1996. He spent his sabbatical leaves at BogaziciUniversity-Istanbul, University of Liege-Belgium, Eindhoven University of Technology-the Netherlands, University of Padova-Italy, University of Sao Paolo-Brazil and Abo Akademi-Turku, Finland. He has been a Professor at the United States Military Academy at West Point-New York since 1998. He is the author/co-author of over one hundred eighty publications and has a US Patent.