

Interdisciplinary Approach in Engineering Education: Case studies of the elective course “Additive Manufacturing” and the special training course “Algorithm Architecture Design Workshop” in Prince Sultan University

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Abstract

The Interdisciplinary Approach in Engineering Education has an important meaning as the aspect of education and training process to explain subjects that is relation with the infusion methods and approaches of previously established disciplines or traditional fields. It considers various research and study areas in terms of connecting and integrating several academic fields or technologies in the pursuit of a new innovative goal. Especially, the new era, what is called, the Fourth Industrial Revolution would “bring disruptive innovations, destroying the existing systems and creating new ones with various disciplines and areas of expertise influencing each other without boundaries.”(K.Schwab, 2016). In this regard, new approach in engineering education urges us to transform from the traditional discipline education process to the innovative and interdisciplinary engineering education process in order to nurture new young generation in the era of the Fourth Industry Revolution.

The study firstly explores the reason why the interdisciplinary approach in engineering education is so important these days, especially by applying new technologies such as 3D printing, algorithm coding process etc. In order to explain the interdisciplinary approach in Engineering Education, the paper introduces the elective course “Additive Manufacturing” and the special training course “Algorithm Architecture Design Workshop” in Prince Sultan University. The former is relevant to the collaboration works of the students who have all different majors in the process of pursuing a team project that created synergy effects for unexpected and excellent outcomes through the interdisciplinary cooperation, while the latter looks into the new architecture design process by applying the algorithm coding process that normally belongs to the concept of computer science programming area, which also shows how it is important of accepting other discipline concept, such as algorithm coding method for the new architectural design process.

Keywords

Interdisciplinary approach, Engineering Education, 3D printing, and Algorithm.