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Design Expert Workshop: a Success with Collaboration between UiTM and JKR CREaTE

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A Design Expert workshop was recently conducted as a result of a joint effort between the Faculty of Civil Engineering at UiTM Penang and five members of the Centre of Excellence in Engineering and Technology (CREaTE) from the Public Works Department (JKR). The workshop was held on March 2, 2023, from 9am to 12pm in the Smart Classroom of the Perdana Block and was led by expert speaker Ir. Ts. Azrizal Mohd Fauzi.

The workshop focused on the use of Design Expert software to design laboratory work for mix design testing using recycled concrete aggregate (RCA) material, which enhances research involving UiTM research grant holders and JKR CREaTE. Factorial and Response Surface Designs were utilized to determine the optimum formula for high-quality mixtures that meet standardized parameters. The process involves conducting laboratory experiments and analyzing the results, which can be time-consuming. However, by using Design Expert software, it becomes easier to design variations in the formula and analyze post-formulation experimental results.

The key point of the workshop was the mix design of RCA, which received high praise from the representatives of JKR CREaTE. They were satisfied with the knowledge sharing and the expeditious process that resulted from the mix design. According to the guest speaker, Design Expert software can be used in various fields, including structure, management, water, and geotech.

In the structure field, the software can optimize concrete strength for high-rise buildings and bridges and determine the right concrete mixture to achieve the necessary density and durability. In management, it can increase concrete production productivity by adapting to demand forecasting and raw material inventory and determine the optimal cost in construction projects to maximize profits. In water, it can determine the appropriate concrete mixture for water tanks, swimming pools, and other water infrastructure, and optimize concrete strength and durability in water and drainage systems. In geotech, it can determine the right concrete strength for constructing retaining walls and roads and adjust concrete mixtures to meet the requirements of supporting structures and underground foundations.

Design Expert enables researchers and engineers to optimize concrete mixtures, maximize product quality, and minimize costs and time. The author hopes that this Design Expert workshop will be continued with future series that involve all interested lecturers and students to enhance their knowledge and skills.

The participants look so excited and enthusiastic listening to the lecture.