

Aspiring Railway Engineers complete Technical Challenges

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Between 17th and 20th July 2017, The Birmingham Centre for Railway Research and Education (BCRRE) at the University of Birmingham hosted 50 secondary school students for a three-day residential programme that involved two design, make and test challenges with railway themes.

‘Rail Solutions Engineering’ is the seventh such event offered by BCRRE under the umbrella of the Smallpeice Trust, thanks to generous sponsorship by Siemens Rail Automation and the College of Engineering and Physical Sciences of the University.

The three day Science, Technology, Engineering and Mathematics (STEM) course introduced the 16 and 17 year old students to the theory and practice of railway engineering. They attended lectures provided by staff from the University and speakers from the Rail Accident Investigation Branch and Siemens and then constructed 1:30 scale models to complete one of two technical challenges, guided by engineers from BCRRE, Arrowvale, Hitachi, Network Rail and SNC Lavalin.

The first challenge was to develop a crashworthy rail vehicle, capable of keeping peak deceleration levels below 10g when being crashed into a solid wall at 2.5 m/s (9 km/h). To make the challenge realistic, heavy

bogies were provided, along with a steel plate to represent the mass of traction and other on-train equipment. The students could choose the materials to create the structure of the vehicle. Sensitive instrumentation was fitted to the models and a high frame rate camera was used to assess the performance of the designs on a test ramp.

The second challenge was to develop a railway control system based on Lego NXT Mindstorm kits. The kits included a wide variety of electronic sensors, servo motors, and an industrial type controller. The challenge was to construct a train that would follow another without colliding, while providing positional control to enable the model vehicles to activate a set of platform doors half way along the test track.

The teams proved to be up to both challenges and enjoyed the experience, as shown in the pictures.

For more information, please visit www.birmingham.ac.uk/research/activity/railway/index.aspx