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Designing Drops, Loops, and Hills: The Physics behind Roller Coaster Design KATHARYN CHRISTIANA, CAROLINA ILIE, Physics Department, State University of New York at Oswego — Almost everyone has seen a roller coaster at one time in their life. They range in type from old wooden coasters from decades passes to modern machines made of steel that allow you to stand up while riding. The basic physics behind these machines is relatively simple, but in the modern world we strive to design bigger and better machines that push the human body and the laws of physics to their limits. But how do the designers of these rides maintain the balance between making riders feel like they're on the brink of death while keeping them completely safe? The answer can be found in basic physics and mechanical engineering. This is a part of the honors thesis that focuses on the mechanical principles applied in roller coaster design. The theoretical part of the thesis will be complemented by a full small scale ride design.

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