Experimental Study of the Tensile Behavior of Structures Obtained by FDM 3D Printing Process	
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Abstract: Fused Deposition Modelling (FDM) is one of the layer-based technologies that fall under the umbrella term “Additive Manufacturing”, where the desired part is created through the successive layer-by-layer addition process with high accuracy using computer-aided design data. Additive manufacturing technology, or as it is commonly known, 3D (three-dimensional) printing, is a rapidly growing sector of manufacturing that is incorporated in automotive, aerospace, biomedical, and many other fields. This work explores the impact of the Additive Manufacturing process on the mechanical proprieties of the fabricated part. To conduct this study, the 3D printed tensile specimens are designed according to the ASTM D638 standards and printed from a digital template file using the FDM 3D printer Raise3D N2. The material chosen for this 3D printing parameter optimization is Polylactic acid (PLA). The FDM process parameters that were studied in this work are the infill pattern, the infill density, and the infill cell orientation. These factors’ effects on the tensile behavior of printed parts were analyzed by the design of experiments method, using the statistical software MINITAB2020.

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