Tecnológico de Monterrey

STUDY IN MEXICO

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Undergraduate Research Program

Project Name	Mechanical metamaterials: mechanics and additive manufacturing
Campus & Location in Mexico	Querétaro
Faculty	Engineering and Sciences
Research Area	Mechanical Engineering
Research Responsible	Enrique Cuan-Urquizo
Description of the Project	Many applications, like skull plates, make use of porosity to reduce weight, and allow air flow in/out human parts. Which is the best or optimal degree of porosity? What are the shapes of the pores? Lattice or cellular materials are materials that could be design in order to fulfil certain effective mechanical properties. Up to now, most of the mechanical characterization have been on planar samples under tensile loading. In reality, structures of complex geometries and shapes are subjected to more complex loading scenarios. The objective in this project, is the study of structures of complex geometry such as shells composed of different lattices and cellular materials under various loading conditions as: bending, torsion, and dynamic loads. Because of the complexity in the geometries, additive manufacturing (3D printing) is explored as fabrication technology.
Training Provided	Training provided by professor in theoretical aspects, and by postgraduate students in lab equipment.

Offered during:

SUMMER	X	WINTER		SEMESTER	X

Student

Tasks/Responsibilities	1.Geometrical design of the samples for mechanical testing 2.3D printing of samples for mechanical testing 3.Mechanical testing of samples 4. Writing technical report or paper
Required Language Proficiency	English B2
Required Skills and Abilities	1.Responsible 2.Basic knowledge in mechanics of materials 3.Basic knowledge on 3D printing technologies 4.Basic knowledge on Matlab 5.Basic knowledge on Finite Element
Other Documents	1) Being at least in your 2nd year of bachelor 2) Accumulative grade point average (GPA) 2.5 3) Official Transcript 4) 2 letters of recommendation of faculty members 5) Resume 6) Letter of intention explaining the reason why you would like to participate in the research program