

THE TOPOLOGICAL STUDY OF FORM

CourseNo: ARCHA4524_001_2015_1

Meeting Time: R 06:00P-08:00P **Meeting Location:** AVERY HALL 504

Instructor Information:

[Jose Isaias Sanchez](#)

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This course focuses on small scale design that interfaces and interacts with the kinematic functions of the human body. We will look at defining human interface design by disregarding the use of nouns used to refer to objects with which we interact in our daily lives. Instead, we'll develop definitions of the kinematic functions we perform in the context of everyday tasks, and without resorting to known object categories.

Limiting the size of the design to the human scale will allow us to become familiar with the body's anatomy and how human kinematics work in the context of how we interface with our immediate physical surroundings.

With the fast adoption of small scale manufacturing technologies, such as 3D printers, laser cutters and CNC machines, manufacturing has been migrating from mass-produced designs to human-scale, personal designs. 3D printing in particular has disrupted most design disciplines, including the medical industry, housing construction, jewelry design, and the food industry, among others. Designers no longer need to rely exclusively on injection molding to realize a design since we can personally design, test and manufacture objects at small volume production.

Design Process: We'll avoid using preconceived legacy models; instead we'll focus on defining the functional needs of the design. For instance, in designing a chair, all sorts of preconceptions of what we think a chair is will greatly influence the design process. This kind of approach to design will yield a design typology that reflects our idiom definition of a "chair", but may not be a response to actual kinematic behaviors of the human body.

Modeling Process: We'll explore both, Nurbs and Polygon, in the context of different industry applications. Each type of geometry has its strength and limitations. By choosing a particular modeling workflow, one can optimize the design to be developed with either Nurbs or Polygons.

Kinematics of the Human Body: By studying the human body's kinematics, we'll start to understand, analyze and question how 'fit' traditionally designed objects relate to our actual motion, behavior and needs.

Introduction to Design Visualization: Using Mental Ray for Maya, we will learn how to create object-based, professional renderings for publishing. In particular, we'll study industry-standard, HDR rendering for product design.

Book Reference:

Physics of the Human Body: Irving P. Herman. Springer

The Meaning of the Body: Aesthetics of Human Understanding: Mark Johnson

Scientific American: A Question of Time: The Ultimate Paradox: Scientific American Editors

A Brief History of Time: Stephen Hawking