

Plan Your Project

Title: Designing for 3D Printers

Ask Yourself

What will learners get from the screencast that they don't get from text or discussion?

Slides are designed as a quick reference. Screencasts provide extra depth/explanation.

- Rationale is provided for the suggested techniques: why you should chamfer edges/use teardrop holes, etc., as opposed to just being told to do it.

How will they apply this learning during the course?

Students will refer to this information when designing 3D printed parts for project courses and personal projects. It's designed as a resource to be used in a variety of courses, as opposed to just one.

Learning Objectives

From watching this video students will learn...(Be specific!)

- Identify which specifications of a model of printer are important, and which aren't: x-y resolution build volume, usable materials, etc.
- How/why to avoid using support material, and using it effectively when you have to use it
 - 45 degree rule
 - Avoiding hanging geometry
 - Planning for printing: thinking bottom-up, designing your model in pieces
- How to avoid warping and why it happens
 - 'Mouse ears' as an alternative to raft
- Chamfer sharp-angle features to reduce droop and ensure printability
- Designing small features: how to print fine detail, thin walls, clearances for interacting parts
- Real-world advantages of 3D printing
 - Herringbone gears
 - Captive nut design
 - Self-threading holes

Generate Concepts

How long will the video be?

5 minutes per concept is a useful guide.

Which concept(s) will be addressed?

Knowing your printer: overview of specifications/statistics and what they mean

Avoiding support material: planning for printing, what geometries can/can't be printed

Small features: making sure your model transfers to reality, clearances, shared edges

Real-world applications/considerations: what shouldn't be printed, what should be printed, captive nuts, self-threading holes

Demonstrated through:

Video of slideshow with voice-over, callouts, and animations (annotated presentation)

Pictures used in slide show to demonstrate design techniques: visuals of models which use techniques/don't use techniques

What Now?

What activities will students engage in related to this video?

Assess Themselves

Questions:

Discuss with Peers

Discussion activities:

Students discuss other solutions to problems with printing

In-class problem/case study

Ideas:

Students re-design a problematic part while preserving functionality: possibly industry-sponsored

Other: