EP1000

Digital Fabrication Prototyping Fundamentals

Introduction

Presented by:

- Willie Tay (Library/Fablab)

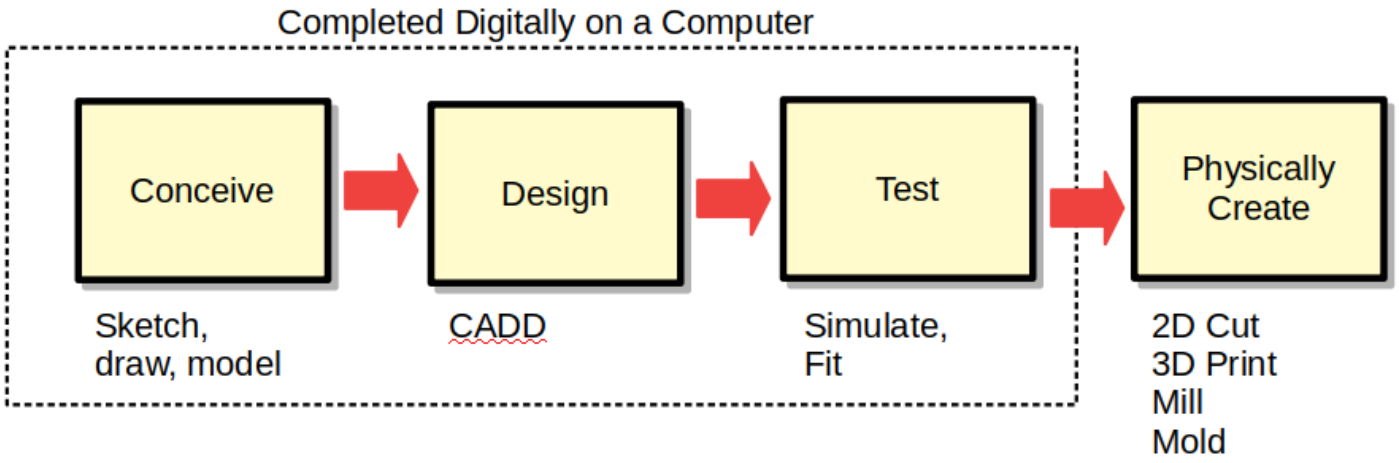
Contact	Details
Email	Willie_Tay@sp.edu.sg
Telegram Messenger	@wilzdezign
Office Tel:	6870 4887

Digital Fabrication

- Learn how to use Digital Fabrication techniques in
  - Computer Aided Design
  - 3D printing processes
  - Laser Cutting
  - Embedded controllers – sensing & actuation
- Covert your design into a working prototype
- Integrate technologies
- Document and present your prototype.

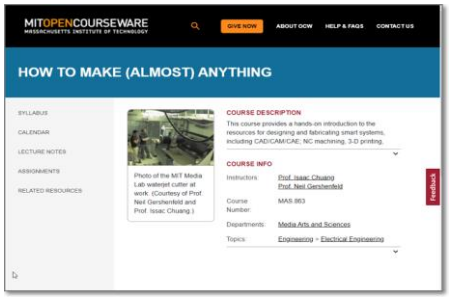
Definition

- Digital modeling and fabrication is a design and production process that uses digital information as its source.
  (Ref: WikiPedia)
  - Digital Fabrication allows you to build your object/idea on a computer and spending **minimal time** as well as expertise in creating the physical object on the actual machine.
- Workflow

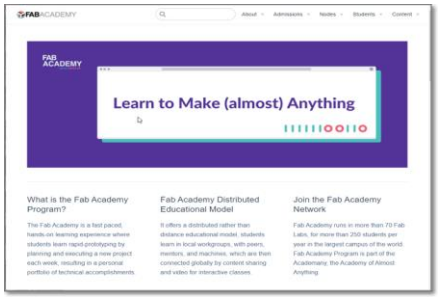


Resources

Fab Foundation



MIT: How to Make



FabAcademy

[Prof. Neil Gershenfeld]

[Manu Prakash]

Assessment

- Course Assessment

Sn	Code	Description	Score
1	CA1	Safety, Documentation, Web site	20%
2	CA2	Digital Fabrication Skills	40%
3	CA3	Summative Project	40%

- Assessment Method
  - Documentation
  - Skill Certifications (Safety, 3D Printing, Laser Cutting)
  - Skill Assignments (mini-practical projects)
  - Module Project

Course Schedule 22/23 Sem 2

Week	Date	Topic	Comments
1	17 Oct	Introduction, Fablab Safety, Tools, Documentation, HTML	Safety Quiz Assessment
2	24 Oct	Software Tools, HTML & CSS, Website,	Public Holiday
3	31 Oct	Github Pages, Version Control, Website	Project Blog / Website
4	07 Nov	Computer Graphics - Raster, Vector Fusion 360, 2D-CADD	2D graphics exercises
5	14 Nov	3D Modelling techniques	3D modeling exercises
6	21 Nov	3D Printing Process	3D printed Assignment - Handphone Holder
7	28 Nov	Computer Controlled Cutting Process	Laser Cut Assignment - Accessories Box
8	05 June	Laser Cutting	Laser Cutting Quiz & Evaluation
9,10,11	06 June	Term Break (3 weeks)	

Course Schedule 22/23 Sem 2

Breadboarding, soldering, simulation, TinkerCAD, Uno

Week	Date	Topic	Comments
12	2 Jan	Basic Electronics Arduino System	Public Holiday
13	9 Jan	Basic Arduino Programming Simple Input/Output interface	Simulation – Uno, Switch & LED interfacing
14	16 Jan	Input Devices / Output Devices Switches, Ultrasonic, Sensors	Light, Sound, Temperature, Ultrasonic, DHT-11, Display
15	23 jan	Project Week 1 Conception, Design	Public Holiday
16	30 Jan	Project Week 2 Physical cutting, fabrication	Physical cutting and fabrication
17	6 Feb	Project Week 3 Electronics, Microcontroller integration	Soldering, testing, fitting, integration
18	13 Feb	Final Testing & Presentations	Site, Presentation, 1-minute Video
19	20 Feb	Exam Week - Presentations	Backup Week for Presentation

Extra benefits…

- Besides your grades …
  - Fablab Safety
  - 3D Printing Certification
  - Laser Cutting Certification

- Usage of Fablab, equipment, materials outside of course hours
- Life-long skills in “making”

EP1000
Introduction
End