Mechanical Engineering Curriculum Map

TOPIC	Duration
Unit 1 – **Computer Aided Design (CAD) in two dimensions** Topics: Sketching in Fusion-360, constraints. Sketching MeArm parts (an open source robot arm designed for laser cutting) in Autodesk Fusion-360 from Engineering Drawings. Learn to use constraints when sketching and share designs in this group project.	4 wks
Unit 2 – **CAD in three dimensions** Topic: Parametric modeling in Autodesk Fusion-360. Model 24 parts using extrusions, revolves, sweeps, lofts, threads, holes, chamfers, fillets, patterning and symmetry.	4 wks
Unit 3 – **Assemblies** Topics: Multiple part assemblies in Fusion-360, joints/mates. Bottom-Up and Top-Down approach to modelling a multiple-part assembly in Autodesk Fusion-360. Learn to restrict degrees of freedom of parts by creating joints/mates between parts. Project: Combine the MeArm parts into assemblies inside Fusion-360. 3D print or laser cut the parts, construct and test the MeArm.	2 wks
Unit 4 – **Flexy design** Topic: The engineering cycle. Project: Design and3D print a flexible animal, a “Flexy”, that consists of multiple segments connected with hinges that have to be 3D printed “in place”.	2 wks
Unit 5 – **Computer Aided Machining (CAM) in two and three dimensions** Topic: Router control with Fusion 360 and UCCNC software for Computer Aided Manufacturing (CAM). 2D Project: Design a sticker in Fusion-360 and make it using a CNC router with a drag knife.	2 wks
Unit 6 – Design and build a model of a “movement” Topic: The engineering cycle Project: Design a model of a mechanical “movement” and build a 3D printed prototype. Source: 507 Mechanical Movements: Mechanisms and Devices by H. T. Brown.	2 wks
	16 weeks