

LECTURE ONE

INTRODUCTION TO CAD

Presented by
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Division of Mechanical Engineering
Room 45-102

UQ Mech Engineering is the Home of HyShot

First Scramjet
Engine Operation in
Flight



HyShot in UQ Laboratories



What is an Engineer?

What do Engineers do?

What does "Engineer" mean?

- > Ingenium is Latin for "Mental Power"
- > Ingenuity means "inventiveness"
- > An Engine is a machine of our imagination (engine of our ingenuity)
- > An Engineer conjures up machines

An Engineer Solves Problems?

- The ideal engineer is a composite ... He is not a scientist, he is not a mathematician, he is not a sociologist or a writer; but he may use the knowledge and techniques of any or all of these disciplines in solving engineering problems. (N. W. Dougherty, 1955)

Engineers and Fools

- An engineer is the fellow who can do it for a dime what any fool can do for a dollar (anonymous)

Scientists and Engineers

- Scientists discover the world that exists; engineers create the world that never was (Theodore Von Karman)

Method of Science

- Observe phenomena
- Postulate a theory to explain phenomena
- Conduct experiments to test the theory
- Draw conclusions from the experiments

Engineering Method

- Examine the problem and prior art
- Establish a set of performance specs
- Develop a design concept
- Test the design concept
 - By using mathematical models
 - By building physical models and testing
- Conclude if the design fits the specs

Engineering Science

Design Procedure

- Problem Definition
- Problem Evaluation
- Synthesis
- Analysis
- Communication for Manufacture

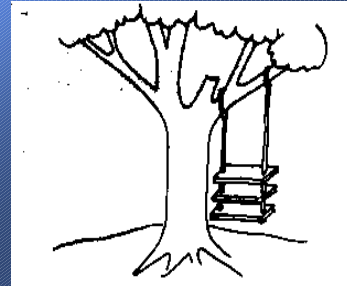
Inspiration vs Perspiration

Genius is one per cent inspiration and ninety-nine per cent perspiration (Thomas Edison)

- > Problem Definition
- > Problem Evaluation
- > Synthesis
- > Analysis
- > Communication for Manufacture
- > Manufacture and Test

19th Century School of Engineering Design

Design a Swing - 1



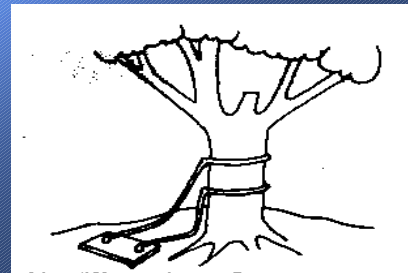
The Sales people think there is a huge demand for this sort of thing

Design a Swing - 2



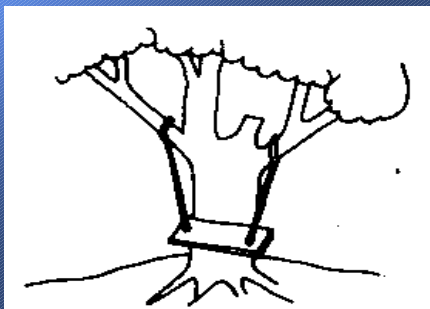
Design Specs - What your boss asks you to do

Design a Swing - 3



As the designer designs it

Design a Swing - 4



As manufactured

Design a Swing - 5



As installed

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CUSTOMISING SOLID EDGE

Solid Edge can be customised to conform with the Australian Standard AS1100-1992

This Customisation is **SAVED** as a **TEMPLATE**

This allows all of your drawings to be consistent

NETWORK ACCESS

5.7 Assessment Detail

Drawing Assignment 1

Weighting: 10

Learning Objectives: 1. Communication, 2. Engineering Drawing,

Due
14 April 2005 4:00:00 PM

Criteria Marking Sheet: [DRAWING ASSIGNMENT No1.pdf](#)

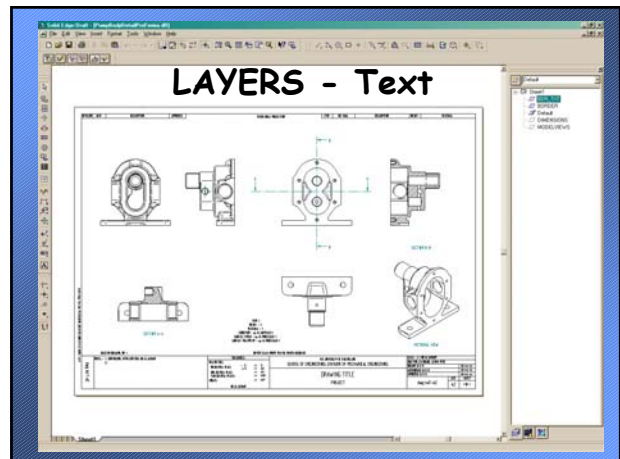
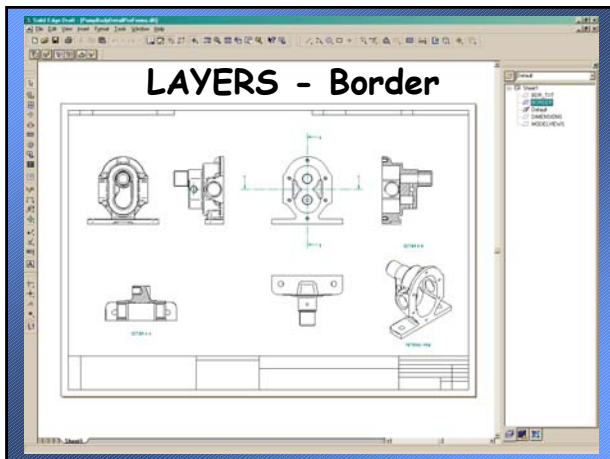
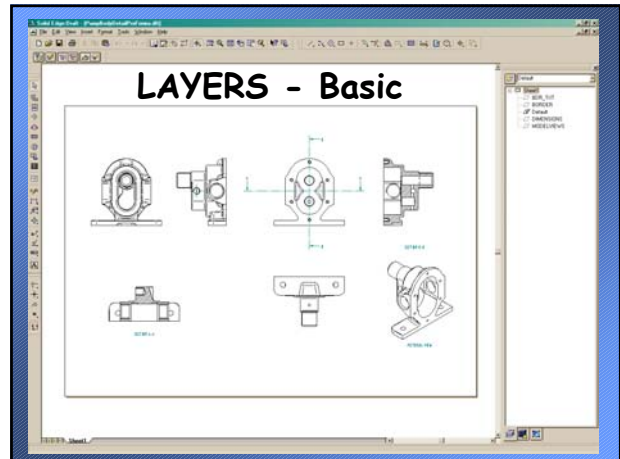
Central Submission: This assessment item is to be submitted through the School of Engineering central submission system. Cover sheet can be created on the School of Engineering website.

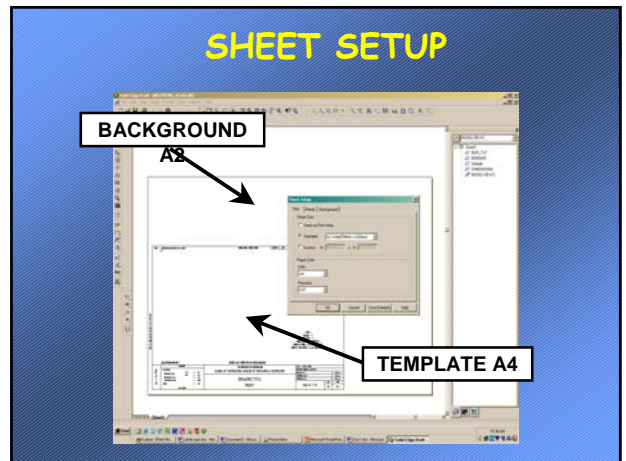
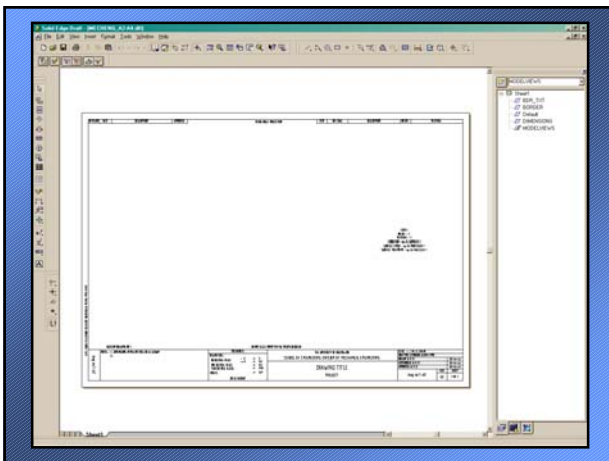
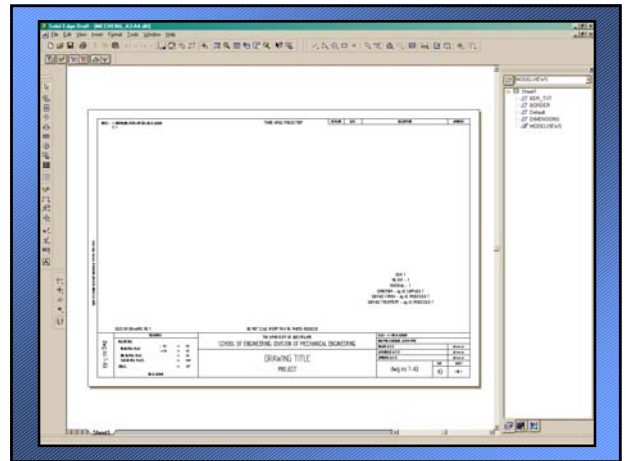
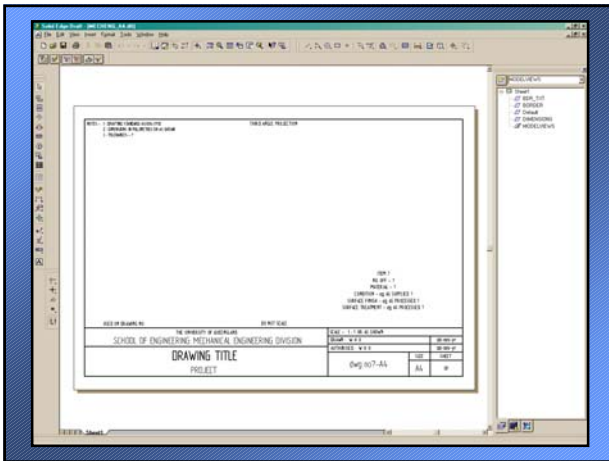
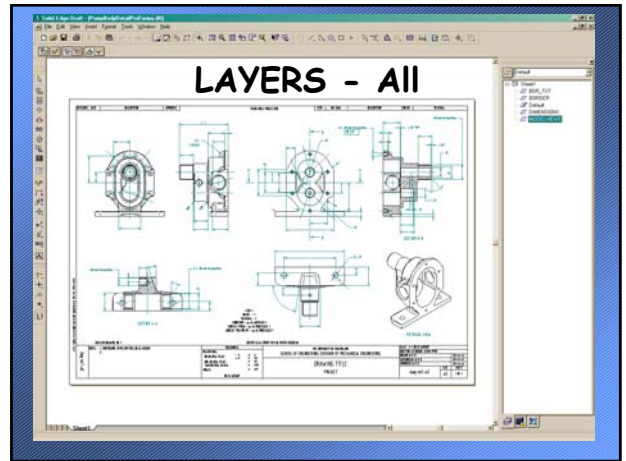
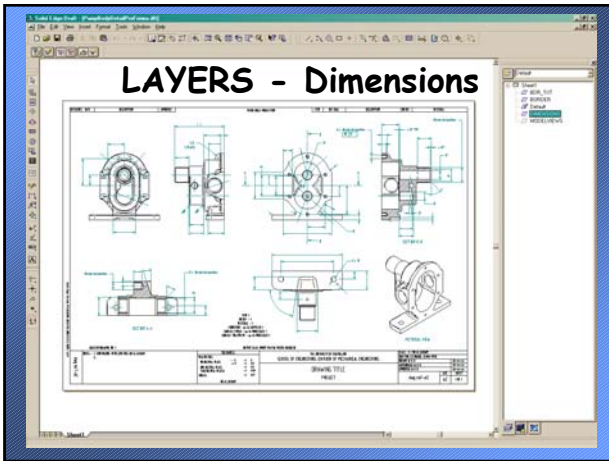
Description: A Solid Model and projected views of a small object.

Related Files:

- A2 TITLE BLOCK TEMPLATE (SOLID EDGE) (MECHENG_A2-A4.drt)
- A3 TITLE BLOCK TEMPLATE (SOLID EDGE) (MECHENG_A3-A4.drt)
- A4 TITLE BLOCK TEMPLATE (SOLID EDGE) (MECHENG_A4.drt)
- DRAWING ASSIGNMENT No. 1 (DRAWING ASSIGNMENT No1.pdf)
- DRAWING EXAMPLE (PumpBodyDetailProForma.pdf)
- FREQUENTLY ASKED QUESTIONS (Mech2305-CAD_FAQ.html)

Found under Course Profiles - Mech2305





SOLID EDGE TUTORIALS

- Please Complete the Tutorial as the first step to the drafting process.
- This will assist in the use of dimensioning feature control etc.
- If you have a problem see a tutor or contact me for assistance in using the Mechanical Drafting Templates.

SOLID EDGE TUTORIALS

Solid Edge Tutorials

Tutorials

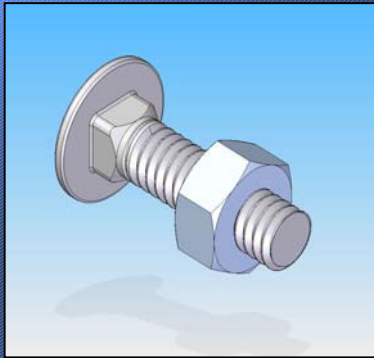
Part Tutorials

Introduction to Part Modeling
 Modeling Pattern Features in Solid Edge
 Modeling Mounting Boss and Vent Features
 Modeling Parts With Sketches
 Modeling Thin-Region Features
 Modeling a Yoke
 Modeling a Part Using Surfaces
 Repairing Disconnected Features
 Modeling a Family of Parts in Solid Edge
 Modeling Helical Features
 Modeling Lofted Features
 Modeling Molded Parts
 Modeling Swept Features
 Using Variables in Part Models

Assembly Tutorials

Building a Slider Assembly in Solid Edge
 Modeling a Sheet Metal Part in the Context of an Assembly
 Building a Grinder Assembly in Solid Edge
 Creating a Tube Part with XpressRoute
 Constructing a Weldment
 Creating a Wire Harness with Harness Design
 Building a Family of Assemblies
 Modeling a Cover Associatively within an Assembly
 Creating and Publishing Virtual Components
Draft Tutorials
 Detailing Drawings with Solid Edge Draft
 Producing an Exploded Assembly View
 Modeling Parts from Drawing Views
 Creating Hole Tables in Detailed Drawings

ASSIGNMENT ONE



ASSIGNMENT ONE

MECH2000 DRAWING ASSIGNMENT No. 1

Using Solid Edge, you will create an engineering drawing for a simple object.
 The following is the object you will model in this assignment. One sample will be given to each student in the first lecture.
 A printed assignment will be submitted and will include the following views:

- *an exploded view of the assembly with a parts list
- *isometric view of each object with clear exposition of important features
- *three views of each object using third angle projection
- *the three views will include all relevant dimensions and tolerances as appropriate
- *material specifications

Contact Mechanical Engineering Office (45-310) to borrow a Vernier Caliper for taking measurements. You will be asked to leave your student ID card with the office until you return the Vernier Caliper back.

1. [Title Page](#)
2. [Contents / List of Drawings](#)
3. [Introduction](#)
4. [Drawings](#)

ASSIGNMENT ONE

Marking Guide

The highest mark is 100. The actual mark will be determined according to the following guide:

General	30%
<ul style="list-style-type: none"> *Frame & Titles *Use of space on paper *Clarity *Line thickness, line categories, font, etc 	
Dimensioning and Tolerances	30%
Assembly Drawing and Parts List	10%
Isometric view (information content, lay-out, etc)	10%
Three views	10%
Annotations (material specifications, default tolerances, etc)	10%