Rosetta Forum - Course Catalog
Solidworks Workshop

工程圖學與CAD建模 - SolidWorks上手基礎
Introduction to SolidWorks: Engineering Graphics and CAD Modeling

Nov. 04, 2024 (Monday) 7:00 P.M. ~ 9:00 P.M.
Nov. 11, 2024 (Monday) 7:00 P.M. ~ 9:00 P.M.

ASSIGNEE: Tzu-Cheng Hsueh

APPROVED BY: Nick Chung, EDU Lead

STATUS: Released

SECURITY: PB

1. Scope of the Course

Aimed at providing participants with the essential knowledge and theoretical foundation for conducting structural design required in aerospace engineering, this includes understanding the basic interface of SolidWorks software, design thinking logic, engineering graphics, and mechanical processing.

2. Course Description

The course includes:

- Structural analysis, mechanism design, dynamics, and statics in the design process.
- Component design workflow, including machining methods, physical limitations, manufacturing processes, and reflection on design details and logic.
- Introduction to common design standards such as ISO, AISI, DIN, and CNS, and their application in design.
- Discuss structural connection interfaces between components and the design approach for overall structural design based on product requirements and specifications.

3. Target Audience

This course will benefit students involved in mechanical structure and mechanism design within research teams, as well as newly joined engineers.

- Students who have taken introductory courses in structures, mechanisms, and dynamics, and wish to gain deeper insights into structural design related to the aerospace industry, especially in hybrid rocket and satellite design.
- Engineers interested in the design, development, manufacturing, and testing of overall structural subsystems.
- Engineers responsible for developing system requirements involving high strength and extreme vibration environments.

4. What You Will Learn

- Basic interface and operations of SolidWorks
- Logical thinking in structural design
- Logic of engineering drawing
- Setting dimensions, tolerances, and surface treatments
- Design integration across different subsystem requirements
- Complete workflow of design, simulation, manufacturing, and testing

5. Course Outline

- **Introduction:** Basic knowledge of CAD modeling and engineering graphics
- **Review:** Mechanism and structural design

6. Instructor

Kim Yu, a Mechanical Engineering student, currently serves as the president of the Institute of Space Propulsion. In this role, he oversees the club's annual projects and ensures the team works efficiently to achieve their goals.

Before stepping into his leadership position, Kim played a key role as the tail fin structure engineer for the 2022 project "WINDBREAK," where his technical expertise contributed to the rocket's stable flight. In 2023, he was promoted to structural team leader for the project "AFTERLIGHT," where he further applied his mechanical engineering skills. That same year, he also interned briefly with the ARRC at National Chiao Tung University during the summer.

Now entering his third year of experience in rocket development, Kim has gained extensive knowledge in rocket structure design, making him a valuable asset to the team.

1. 課程宗旨

旨在為學員提供必要的知識背景和理論基礎，以進行航太工程所需的結構設計，其中包括：認識Solidworks 軟體基本介面、設計思考邏輯、工程圖學和機械加工等。

2. 課程概述

本課程將包括：

- 設計過程結構學、機構設計、動力學以及靜力學等。
- 組件設計流程，包括加工方式、物理限制、製造流程，並反思設計細節的思考邏輯。
- 介紹常見的設計標準如 ISO, AISI, DIN, CNS等，並應用在設計上。
- 零組件間結構連接介面討論，以及從產品需求規格進行整體結構設計的設計思路。

3. 目標受眾

本課程將有益於研究團隊中從事機械結構與機構設計的學生以及新加入團隊的工程師。

- 之前修過結構、機構學和動力學導論課程，並希望更深入了解與航太工業相關結構設計的學生，特別是混合火箭與衛星設計方面的學生。
- 對整體結構次系統設計、開發、製造和測試感興趣的工程師。
- 制定涉及高強度和極端振動環境的系統需求的工程師

4. 你會學到

- Solidworks 基本介面與操作
- 結構設計的思考邏輯
- 工程圖繪製邏輯
- 尺寸、公差、表面處理的訂定
- 不同次系統需求間的設計整合
- 設計、模擬、製造、測試的完整流程

5. 課程大綱

- 介紹：CAD 建模與工程圖學的基礎上手知識
- 複習：機構與結構設計

6. 講師

來自機械系的鈞閎是太空推進研究社的社長，負責確保社團的年度計畫順利進行，帶領團隊以最佳效率完成任務。

在成為社長之前，鈞閎曾擔任 2022 年度計畫「破風」“WINDBREAK” 的尾翼結構工程師，以他的專業知識確保火箭可以穩定飛行。接下來在2023 年度計畫「巡光」“AFTERLIGHT” 中，他擔任結構組組長，進一步發揮機械工程專長。他也在那年短暫加入交大 ARRC 成為暑期實習生，即將邁入第三年的火箭製作經驗中，鈞閎具備許多火箭結構設計不可或缺的知識。