

Mech 2: A Fully-Integrated Second-Year Mechanical Engineering Curriculum

Peter Ostafichuk, Mech 2 Coordinator
Department of Mechanical Engineering
University of British Columbia



Mech 2 Overview

- Change in the way 2nd year Mechanical Engineering is presented
- Only minimal changes to content
- Key aspects:
 - Integration between topics
 - Four primary courses taught in series
 - Team-teaching and team-learning
 - Increased practical skill training

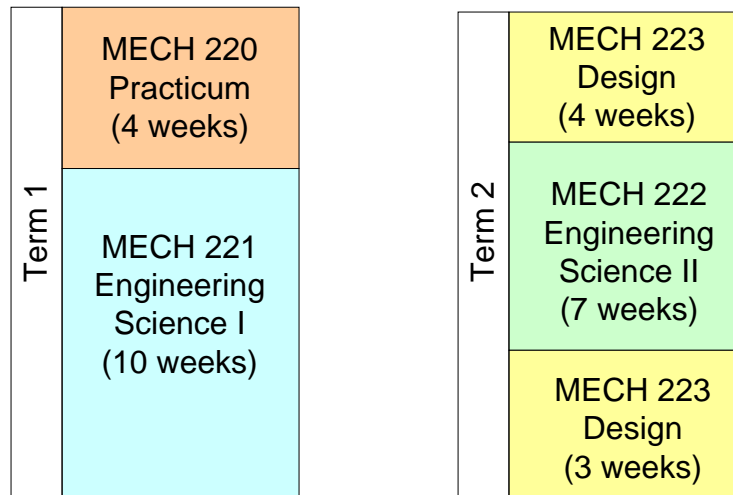


Motivation for Mech 2

- Reduce “compartmentalization” of knowledge
- Increase small-group learning
- Increase hands-on learning
- Present material in more logical sequence



Mech 2 Courses



MECH 220 - Practicum

- 4-week multi-disciplinary project
 - Engineering drawing
 - Software (solid modelling)
 - Machining
 - Instrumentation
- Students produce a working *MagLev* device



MECH 221/222 – Eng. Science

- Integrated content
 - Lectures / labs / tutorials / computer labs/...
 - e.g.: vibrations / RLC circuits / ODE's
- Strong focus on team-teaching
- Shift to small-group activities
 - Fewer lecture hours
 - More tutorials and question/answer sessions
 - Labs and field trips



Typical Weekly Schedule

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8 ⁰⁰ 30	Tutorial	Tutorial	Tutorial		Tutorial
9 ⁰⁰ 30	Lab Prep.		Lab Prep.		Tech Comm
10 ⁰⁰ 30	Lecture	Lecture	Lecture	Field trip or special activity	Lecture
11 ⁰⁰ 30	Lecture	Lecture	Lecture		Lecture
12 ⁰⁰ 30		Lecture			
1 ⁰⁰ 30	Lecture	Tech Comm	Lecture		Lecture
2 ⁰⁰ 30	Lab	Tutorial			Computer Lab
3 ⁰⁰ 30		Q/A Session			
4 ⁰⁰ 30			Lab		
5 ⁰⁰ 30					



Field Trips



MECH 223 – Mechanical Design

- Two design projects
- Classes/tutorials
 - Design methodology
 - Tech. communication
- Team skills
 - Group dynamics workshops
 - “Team-based learning” model used for course



Outcomes and Observations

- Key aspects:
 - Integration between topics
 - Team-teaching and team-learning
 - Increased practical skills
- Program coordinator required
- Academic performance
 - Similar overall
 - “Mature” students thriving
 - Some students struggling



Outcomes and Observations

- Increased enrolment
 - Demand for Mech. Eng. up by ~15%
 - Admission average up by ~4%
- Improved technical communication skills
 - Fail rate: 3% versus 16.5% for rest of faculty
- Greatly increased camaraderie
- Instructors much closer to students
 - Rapid identification of student difficulties
 - Easier to track student progress
 - Much more cordial student-teacher relationship



Thank You!

Questions?



UBC Engineering

- Common first year
- Students choose Dept. for second year
- ~120 spaces in Mechanical
- 4 year program in total
- Options for co-operative education and specializations



Design Projects

