



# Chem Eng 1010: Professional Practice I

## Topics

- Introduction to the profession & discipline of chemical and process engineering
  - History, present & future of chemical engineering
  - Important industries, companies and issues
  - What do chemical engineers do?
  - A taste of key concepts in chemical engineering
- Transition to university
  - Physical & virtual orientation
  - Learning styles
  - Student and staff expectations
- Communication skills



# Professional Practice I



## Modes of delivery

- Lecture / seminars (15 – 50 min.)
- Workshops / tutorials (< 120 min.)
- Oral progress reports (10 min. in blocks of 60 min.)
- Structured group-based activities (15-30 min.)
- “Free” group time (10 – 60 min.)
- Presentations from practicing chemical engineers (50 min.)
- Site visits (4 hrs)
- Engineers Without Borders Challenge





# Engineers Without Borders (EWB) Challenge

## Who are EWB?

- EWB work in partnership with NGO's and developing communities to deliver knowledge, resources and appropriate technologies to improve livelihoods

## What is the EWB Challenge?

- An design competition for Australasian first-year university students. Students work in teams to develop conceptual designs for real international development projects
- Used widely in Engineering programs at Australian Unis
- A new, fully-resourced, open-ended design project is delivered every year
  - 2011: Devikulam, India
  - 2010: Kooma Traditional Owners, South-West Queensland
  - 2009: Tonle Sap Region, Cambodia
  - 2008: Kandal Province, Cambodia



# Engineers Without Borders (EWB) Challenge

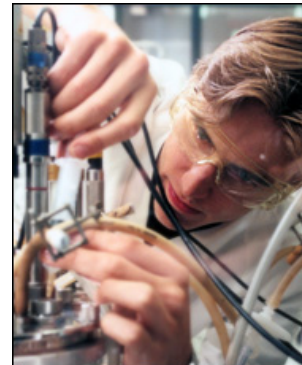
## Open-Ended Project Topics (examples from 2011)

- Building Construction & Housing
- Transportation
- Water Supply and Sanitation
- Energy
- Waste Management
- ICT for Educational Activities



## Resources

- EWB Challenge website· Monthly e-Newsletter
- Online FAQ Forum
- Maps
- Videos & Images
- Suggested readings
- Previous student reports



# Engineers Without Borders (EWB) Challenge

## Developing Graduate Attributes

- Social, cultural, global and environmental responsibilities
- Principles of sustainable design and development
- Professional and ethical responsibilities
- Ability to function effectively as an individual and in multi-disciplinary and multicultural teams.
- Skills in problem solving
- Application of basic science and engineering fundamentals
- Communication



# Structured development of basic engineering communication skills:

## Generally, at University of Adelaide:

- Do not explicitly teach engineering communication skills ...
- ... but, rather, provide opportunities to practice specific genres of technical writing
  
- Require EAL students to complete a communication subject which is presented largely without context
- Require EAL students to replace one technical subject with the EAL subject
  
- Provide remedial assistance to all International students ...
- ... assume local students do not have special needs
- ... assume all International students





# Structured development of basic engineering communication skills:

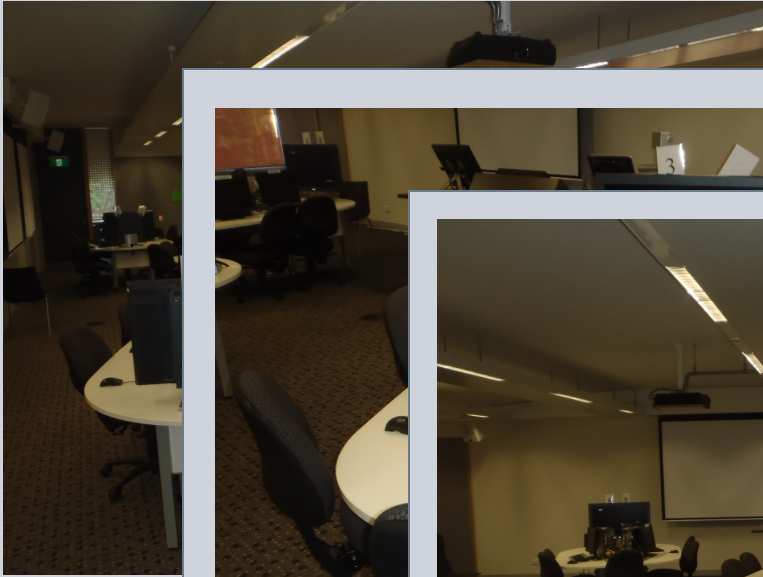
## Communication Skills in Professional Practice I

- Students with special needs (local and International) are identified using simple writing diagnostic in Week 1
- A qualified tutor is provided to work with students at risk via ad-hoc sessions
- Communication topics included within the curriculum and taught by Specialist from Engineering Communication Unit
  - Finding and using academically appropriate sources
  - Structure of evidenced-based technical writing
  - Register and cohesion for technical writing
  - Seminar presentations
- Individual assessment tasks to assess communication skills within context of EWB Challenge
  - Individual literature review

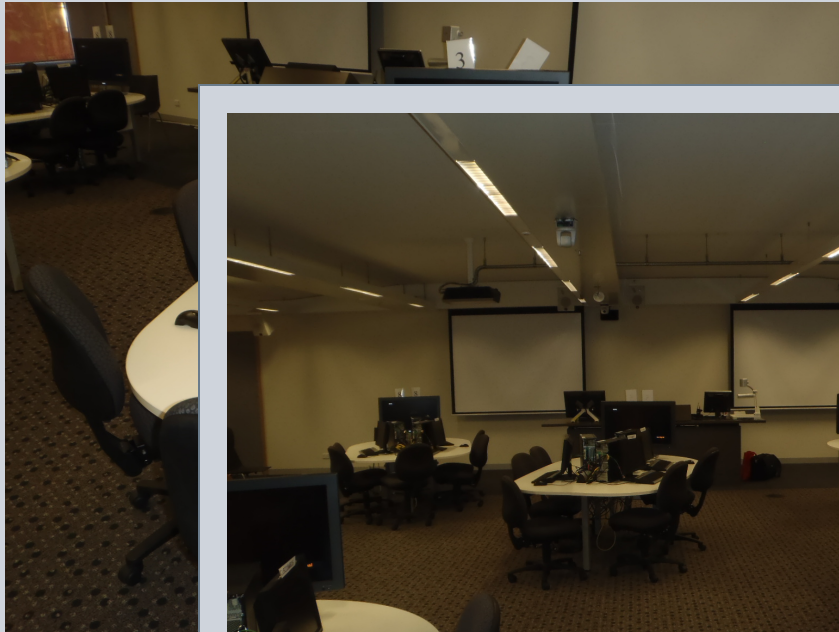




# Collaborative Teaching Suite (CTS)



Teacher



Group p



Student view ...







# Collaborative Teaching Suite (CTS)

## What do students say:

"... each group has their own table and computers to work at (which) makes group work easy ... the group is in a circle so everyone can hear everyone else's ideas effectively"

"Essentially, no matter which direction you face, you'll be able to see what's going on ... Even though the room is very large, the group workspaces are set out so the lecturer is audible and there is sufficient room to move around"

"... would be nice to have five computers ... the extra workspace is nice too ... not everyone needs a computer at any one time"

"For the material that needs to be delivered in Professional Practice ... the working space is perfect"





## Summary

- A new course has been successfully introduced which deals with a student-identified need to identify with their chosen discipline
- The EWB Challenge is an off-the-shelf, well-resourced open-ended project for first-year university students which develops key graduate attributes
- EWB Challenge provides context for explicitly teaching engineering communication skills using a model which identifies and supports students-at-risk
- The new CTS is an ideal teaching space for students and teachers, especially for delivering blended content

