

# RoboRugby 2010

Robotics Design Project  
EEEN 10020

## Lecture 7 – Technical Writing, Interim Report, etc.



UCD School of Electrical,  
Electronic and Mechanical  
Engineering

Scoil na hInnealtóireacta  
Leictre, Leictreonaí agus  
Meicniúla UCD

## Topics

- **Interim Report**
  - individual report - **not** team effort
  - worth 20% of module grade
  - **due Wednesday 24 March (at start of lab)**
- **Technical Writing**
  - how to write a technical document
- **Other issues**
  - battery management
  - program security
  - extra lab sessions



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## Module Grade Breakdown 2010

- **Team Effort:** 45%
  - design & performance of robot 15%
  - quality of competition program 15%
  - challenge reports: 2 + 2 + 3 + 3 = 10%
  - strategy report 5%
- **Individual Effort:** 55%
  - interim report (due week 8) 20%
  - short presentation (week 10) 5%
  - final report (due week 12) 30%
- **Team effort grades adjusted by contribution**
  - team members need not get equal share



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## Interim Report - Contents

- **Cover sheet**
  - standard UCD assessment submission form
- **Identification**
  - name, student number, team details
  - team name - as agreed by team
- **Strategy**
  - summary of strategy report - in your own words
  - **want to see evidence of design process...**
- **Robot Design**
  - what is critical to implementation of your strategy?
  - what other qualities will your robot have? why?



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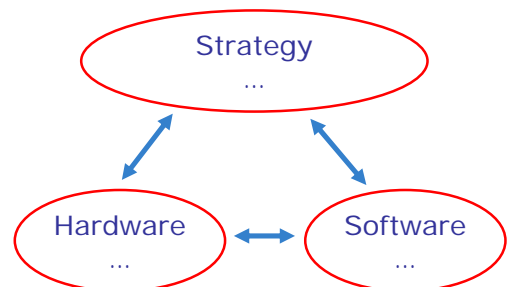
## Interim Report continued

- **Chassis Design**
  - size, shape, wheels, gearing, etc.
- **Special Features**
  - anything special needed for your strategy
- **Software**
  - outline of program structure (words or flow chart)
  - variations planned for ranking round ?
- **Performance in Demonstration**
- **Project Plan**
  - what are the key tasks remaining?
  - who is working on each task ?
  - timetable for completion of each task



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## Design Process



**Don't underestimate  
the software task!**

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## Interim Report continued

- **Individual report**
  - team decisions, but you report in **your** words...
  - copying from team members will be penalised!
- **Guideline length ~ 4 to 5 pages (+ cover)**
  - long enough to include all essential information
  - no padding - if it all fits in 3 pages, stop!
- **Printed report, stapled, standard cover page**
  - example report on web site
  - standard cover page on web-site
  - **due at 3pm, Wednesday 24 March**
  - sign in at start of lab session
  - penalties for late submission



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## Technical Writing

- **Engineers often need to write technical reports**
  - describing work done
  - results of investigation, conclusions reached
  - proposal for project
  - etc. ...
- **Vital to be able to communicate your ideas**
  - to colleagues...
  - to management...
  - to customers...
- **Details differ depending on document**
- **Basic principles remain the same**



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## Technical Writing...

- **1. Think of the Reader!**
  - who will read this document?
  - what level of knowledge?
  - what needs?
  - read entire document or browse?
- **2. Know why you are writing**
  - must have clear idea of aims and objectives
  - if you don't know, you shouldn't be writing it!
- **3. Keep it short!**
  - tell the story, give the facts, make arguments or recommendations, then STOP
  - short report is more likely to be read



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## Technical Writing...

- **4. Structure**
  - organise in sections, to suit reader (esp. browser)
  - use sub-sections as needed (many levels ?)
  - heading on each section - helps the reader
  - different heading style for each level
  - numbered headings - depends on size, complexity
  - table of contents - vital in long report
- **5. Style of writing**
  - be yourself - everyone has individual style, but...
  - be clear and concise - no long rambling sentences!
  - use reasonably formal, consistent style
  - distinguish between **opinion** and **fact**
  - give source of facts - references



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## Technical Writing...

- **6. Diagrams, Pictures, Tables, Graphs**
  - use any/all of these **if helpful**
  - must be clear and un-ambiguous
  - place where convenient
    - ideally on page where referred to
    - not breaking up flow of text
  - in long formal report, caption and number
    - **Figure 3: Main gear mechanism**
    - ... as shown in figure 3.
- **7. Summary**
  - depends on requirements
  - must give **all** vital information in a few lines
  - can be hardest part to write - leave to end!



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## Technical Writing...

- **8. Presentation**
  - keep it clear, not cluttered
  - good margins
  - space above headings, between paragraphs...
  - headings should stand out, not startle, draw attention to text, not distract from it
  - number the pages
- **9. Check your work**
  - ideally, get someone else to check it...
  - or check it yourself, a few days later!
  - we tend not to see our own mistakes...



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## Example

**A** Restricted Access Barrier System is an advanced aseptic processing system that can be utilised in many applications in a fill-finish area. RABS provides an enclosed environment to reduce the risk of contamination to product, containers, closures, and product contact surfaces compared to the risks associated with conventional clean room operations. For further information on RABS please

### 2. Preparation of the interventions matrix

The preparation of an interventions matrix is a labour-intensive exercise detailing all possible interventions on the filling line (Manufacturing, Engineering & Quality IPC) and ranking their potential difficulty through RABS gloves (from "1" being no difference in performing operation through RABS gloves to "5" being impossible to perform through RABS gloves).

There is little point in having a building capable of being energy efficient if it is not operated properly. A well installed building energy management system (BEMS) has the power to deliver on these design objectives. With the implementation of the European Performance in Buildings Directive (EPBD), building owners really want to know how much energy their building consumes and how it can be run more efficiently. In this article James Galvin DE MBE CEng, Managing Director, Cylon Controls Ltd looks at how a BEMS can help deliver an 'A' rated building and explores how recent developments in BEMS technology can deliver on the sustainable energy promise.

**E**ven of the last twelve years (1995 -2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850). Ireland has thus far failed to live up to its Kyoto commitment of limiting the increase of greenhouse gases to 13 per cent above its 1990 levels by 2012. Current levels of greenhouse gas emissions are more than 25 per cent above 1990 levels with a continuing upward trend. The Irish Energy White Paper of March 2007 targets 30 per cent savings in energy across the electricity, transport and heating sectors by 2020. The white paper commits the government to updating national building regulations governing energy efficiency of new buildings and buildings subject to major renovations.

The EPBD came into force in 2006 and the stated focus has been on insulation and mechanical plants. However there is little point in efficient plant if it is not correctly managed. Building owners should be aware of the importance of the BEMS in an energy to move beyond this and ensure a proper operation and maintenance focus.

## Battery Management

- Handyboard has re-chargeable battery
  - powers Handyboard and motors
  - finite capacity!
- Charge through white cable from interface unit
  - yellow light shows normal charging
  - charges faster when Handyboard switched off
- Discharges if Handyboard switched on
  - also if interface unit connected, not powered
- Switch off and leave charging during lab
- Switch off and disconnect cable at end of lab



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## Program Security

- Computer equipment is not 100% reliable
  - hardware fails - e.g. hard disk unreadable
  - laptops get lost or stolen
  - memory keys get lost or broken
  - etc., etc.
- You need at least **two** copies of your program
  - on different devices
  - stored in different places
- This is **your** responsibility!
  - all lab PCs have USB port - use memory key(s)
  - e-mail program to yourself



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## This Week

- Demonstrate robot moving on table
  - even if some features missing
  - will play against another robot
  - should do something useful for 15-20 seconds
  - manual start - not competition startup
- Design competition program - outline
  - stage 1, stage 2 ...
  - decide what ends each stage
  - **exit from loops in stage 1 before starting stage 2**
- Collect information for interim report
  - agree team name
  - agree project plan



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## Extra Lab Sessions ?

- ~14 hours scheduled lab time remaining...
- Additional time available today – 4 to 6pm
- Possible extra sessions?
  - do you want them?
  - when are you available?
- Extra sessions optional
  - come if you need more time and are available
  - try to bring entire team
- Limited or no assistance available!



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