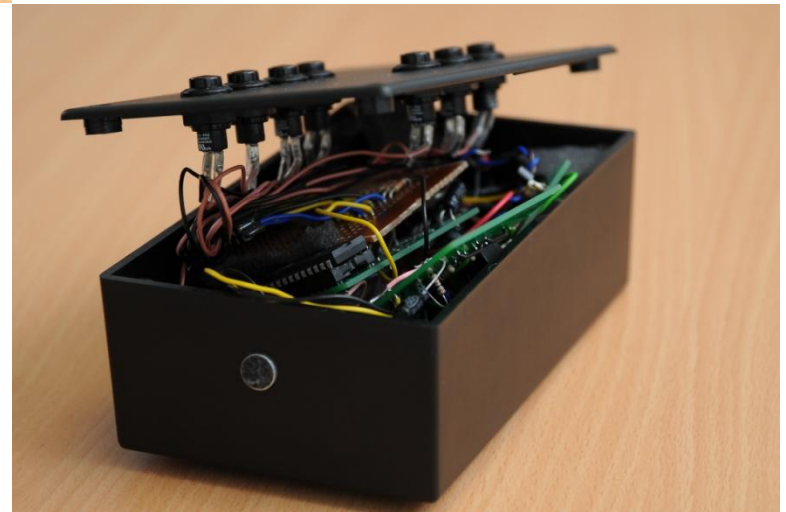
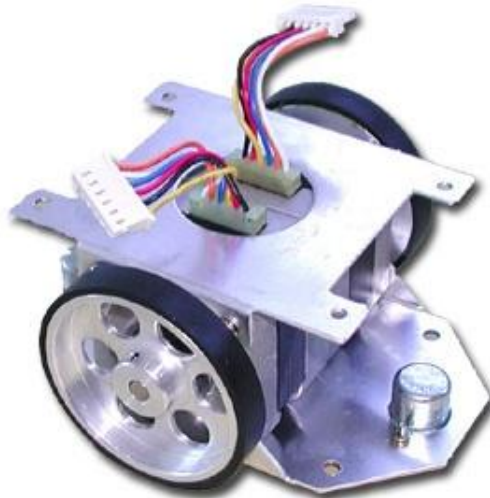
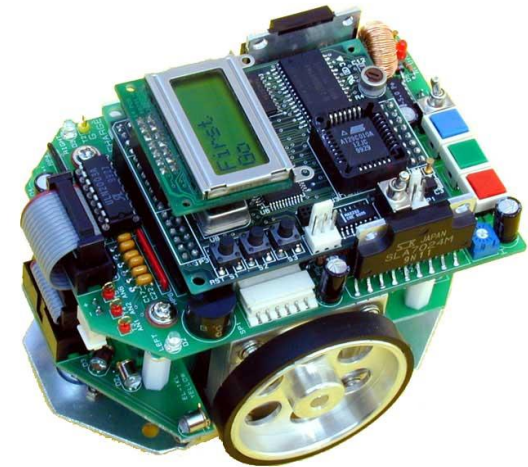




ENGG3800 – Team Project II

METR3800 – Mechatronic System Design II

2nd Semester 2009





Course Staff

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Course Tutors

ENGG3800 Tutors

Aaron Tighe

Rachael Morgan

Matt Wallace

Scott Barber

METR3800 Tutors

James McGill

Chris Lehnert



Course Prerequisite

- The only prerequisite for ENGG3800/METR3800 is ENGG2800 or METR2800.
- Students who have not completed ENGG2800 or METR2800 are not permitted to enroll in ENGG3800 or METR3800.




Resources & Contact Methods

- Course website (has all lecture and tutorial notes, product spec, etc)
 - <http://www.itee.uq.edu.au/~engg3800> (ENGG)
 - <http://blackboard.elearning.uq.edu.au> (METR)
- Newsgroups are the primary form of announcements for ENGG3800, check them regularly! Tutors will monitor the newsgroups heavily. For METR3800 students, the primary form of announcements is blackboard.



Contact Sessions

- Tutorial Sessions 
- Practical Sessions
- Lectures
- Assessed Team Meetings

Tutes

- This semester we are running tutorial sessions.
 - Altium introduction (*Weeks 2-3, further details will be available on the course website*)



What's new to ENGG3800/METR3800?

- Written Reports
- Peer Assessment
- Assessed Meetings
- Advanced Features (Applies to ENGG3800 only)
- Software Design is now assessed.
- Changes to product bonuses/penalties



Lectures

Week Number	Lecture Topic
1	Introduction
	Scrum Management
2	Scrum Management
3	3D Modelling & Physics
	Software Design Practices
4	Electronics Design
	Q&A
5	PCB Design Practices
	Q&A
6	Is it a Good Idea to Patent your Good Idea?
7-12	Q&A
	Q&A



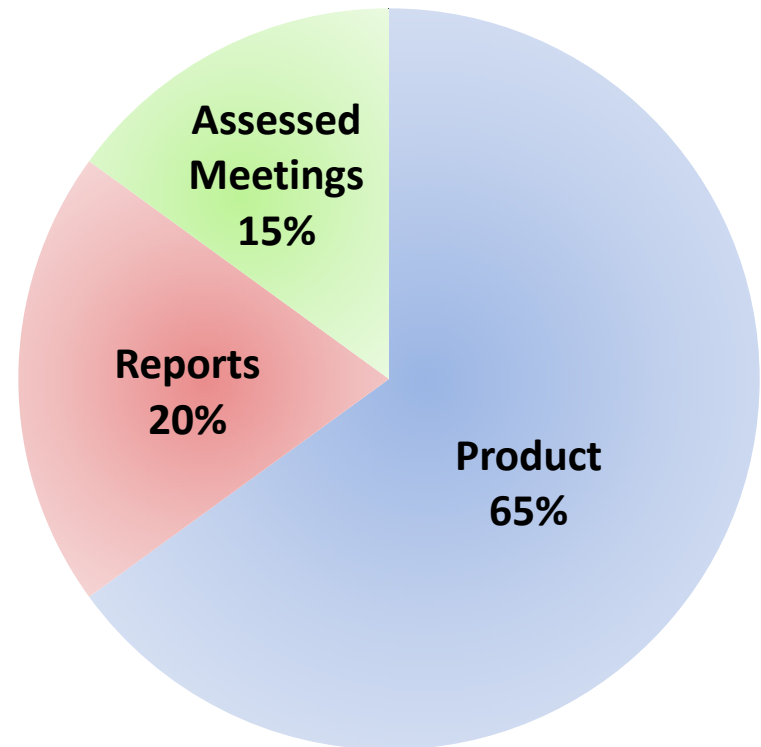
Pracs

- ENGG3800 - There is one session per week. 8-10am Tuesdays starting Week 2. **New lab!** 47-210 (Axon Building)
- METR3800 – There is one session per week. 2-4pm Thursdays. 50-C404 (Hawken Building). Starting Week 1.
- The prac sessions are your primary opportunity for you and your team to meet and ask the tutors some questions.
 - It is also a very good opportunity to show draft reports to tutors.
 - Or get verbal feedback on assessment items.



Assessment Breakdown

- **65% Product** (*scaled by your Peer Assessment!*)
- **20% Written Reports**
 - In addition, two reports are pass/fail
- **15% Assessed Team Meetings**
- **Peer Assessment** (*scales your product mark*)
- **Mid-semester Peer Assessment** (*has no effect on your grade*)





Assessment – The Product

- Due Monday week 13 at 10am.
- METR3800 – Hand in at the lab
- ENGG3800 – Hand in to Don's office.

- Your product will be assessed on Demo Day; we will not take into account past performance.

- The product assessment is based on completeness.
 - You are MUCH better off having a complete working product, rather than having a semi-complete product with some fancy features or bonus marks.
 - You will NOT receive bonus marks or marks for advanced features if your product does not meet all basic functionality.



Assessment – The Product (Bonus/Penalties)

- Your product must be submitted in testable form by the due date
 - -1 mark/hour late penalty.
 - +1 mark/day early bonus.
- The total cost of your product must come under budget.
 - -1 mark/\$1 over budget penalty.
 - +1 mark/\$10 under budget bonus.
- There must be no errors in your submitted project files.
 - -1 mark/error penalty.
- **No cap on individual bonuses, but overall capped at 10 marks.**



Assessment – The Product (Advanced Features)

- In order to implement advanced features, your team must submit a written proposal to us detailing your advanced feature. Your proposal must illustrate:
 - User benefit.
 - Product hardware and software changes.
 - A testing plan.
 - And an approximate workload.
- There is no penalty for not implementing your proposed feature.
- Due in Week 10. The ENGG3800 website has full details.
- An example proposal will be uploaded to the course website.



Assessment – The Product (Software Design)

- In much the same way as the reliability of your electronic design and the ruggedness of your mechanical design are assessed; *the quality of your software design will be assessed.*
- Your code needs to be designed for ease of future maintenance and improvement.
- It must be well structured, commented, and follow a style guide of your team's choosing. In addition, you code should be tracked in the school-provided team Subversion repository.
- This applies to firmware and PC software.



Assessment – Peer Assessment

- Your Peer Assessment mark will scale your product mark; your product mark can be increased by the scaling factor, but overall it is capped at 65.
- In addition, you will be required to submit Peer Assessments roughly half-way through semester in an assessed meeting. These mid-semester peer assessments won't have any effect on your grade.



Assessment – Peer Assessment

- The formula:

$$\text{(Product mark + Bonus marks)} \times \left(\frac{\text{Scaling Factor} \times 4 \times \text{Your mark}}{\text{Total peer marks in your group}} \right)^{0.6}$$

- This is capped at 65% of the course.
- Your performance is relative to the groups performance.
- Let's see how it works.....



Assessment – Peer Assessment

- Raw marks 9, 13, 13, 14 out of 15 (total is 49)
- Product mark of 50/65

$$(Prod + Bono) \times \left(\frac{4 \times Your\ Peer}{Total\ Peer} \right)^{0.6}$$

$$\bullet \text{ Product}_{\text{Member 1}} = 50 \times \left(\frac{4 \times 9}{49} \right)^{0.6} = 50 \times 0.83 = 41.6$$

$$\bullet \text{ Product}_{\text{Member 2\&3}} = 50 \times \left(\frac{4 \times 13}{49} \right)^{0.6} = 50 \times 1.04 = 51.8$$

$$\bullet \text{ Product}_{\text{Member 4}} = 50 \times \left(\frac{4 \times 14}{49} \right)^{0.6} = 50 \times 1.08 = 54.2$$



Assessment – Peer Assessment

- Raw marks 15, 15, 15, 15 (high confidence group)
- Product mark of 12/65

$$(Prod + Bono) \times \left(\frac{4 \times Your\ Peer}{Total\ Peer} \right)^{0.6}$$

- Product = $12 \times \left(\frac{4 \times 15}{60} \right)^{0.6} = 12 \times 1.00 = 12$

- Raw marks 1,1,1,1 (low confidence group)
- Product mark of 50/65

- Product = $50 \times \left(\frac{4 \times 1}{4} \right)^{0.6} = 50 \times 1.00 = 50$



Assessment – Peer Assessment

- Raw marks 3, 15, 15, 15 (total is 48)
- Product mark of 50/65

$$(Prod + Bono) \times \left(\frac{4 \times Your\ Peer}{Total\ Peer} \right)^{0.6}$$

- Product_{member 1} = $50 \times \left(\frac{4 \times 3}{48} \right)^{0.6} = 50 \times 0.44 = 21.8$

- Product_{members 2,3,4} = $50 \times \left(\frac{4 \times 15}{48} \right)^{0.6} = 50 \times 1.14 = 57.2$



Assessment – Peer Assessment

- What about teams of three?
- Peer Marks 9, 13, 14.
- Product mark of 50/65

$$(Prod + Bono) \times \left(\frac{4 \times Your\ Peer}{Total\ Peer} \right)^{0.6}$$

- Product_{Member 1} = $50 \times \left(\frac{4 \times 9}{36} \right)^{0.6} = 50 \times 1.00 = 50.0$
- Product_{Member 2} = $50 \times \left(\frac{4 \times 13}{36} \right)^{0.6} = 50 \times 1.25 = 62.3$
- Product_{Member 3} = $50 \times \left(\frac{4 \times 14}{36} \right)^{0.6} = 50 \times 1.30 = 65.2$



Assessment – Peer Assessment

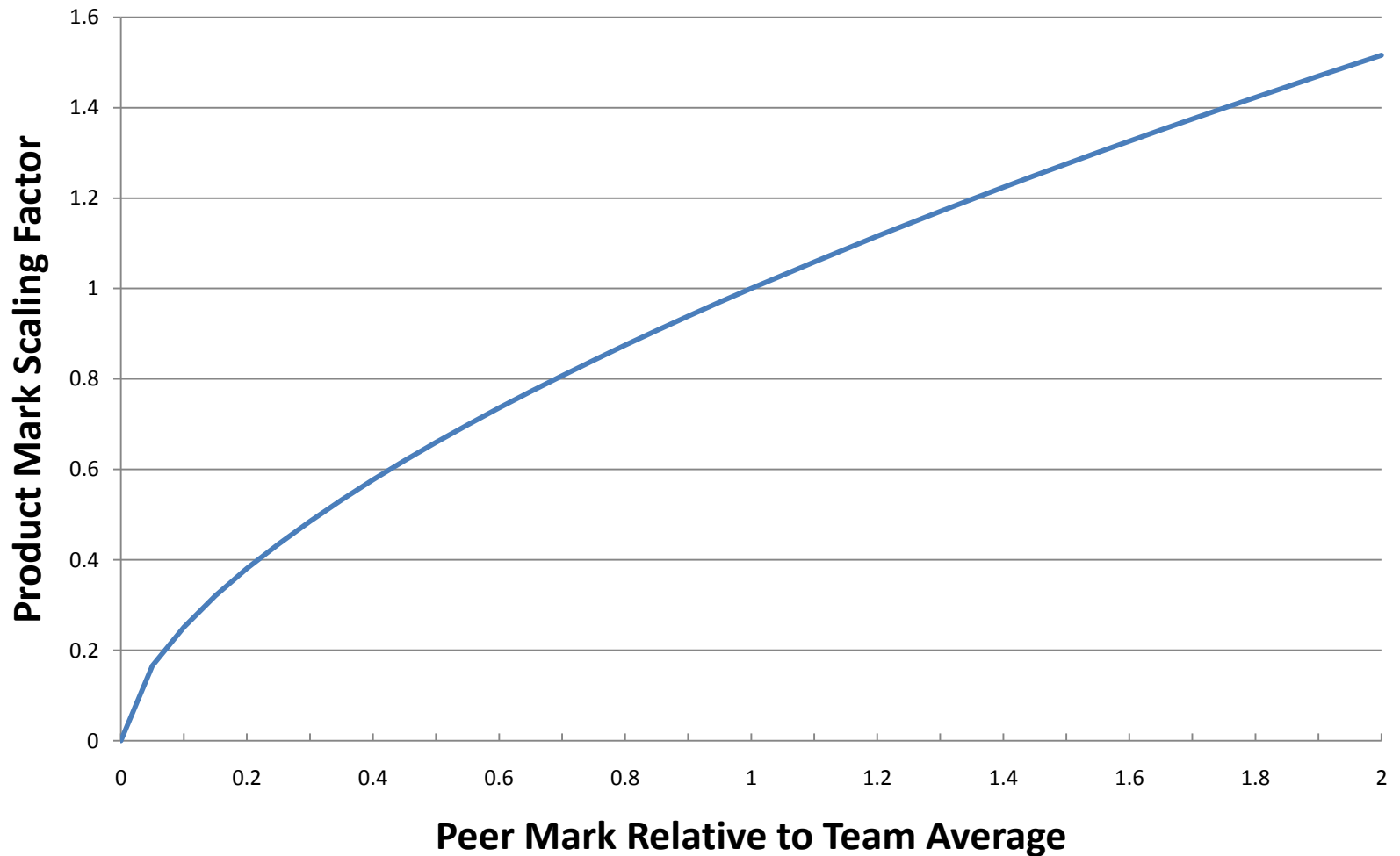
- What about teams of five?
- Peer Marks 9, 13, 13, 14, 14.
- Product mark of 50/65

$$(Prod + Bono) \times \left(\frac{4 \times Your\ Peer}{Total\ Peer} \right)^{0.6}$$

- Product_{Member 1} = $50 \times \left(\frac{4 \times 9}{63} \right)^{0.6} = 50 \times 0.71 = 35.7$
- Product_{Member 2&3} = $50 \times \left(\frac{4 \times 13}{63} \right)^{0.6} = 50 \times 0.89 = 44.6$
- Product_{Member 4&5} = $50 \times \left(\frac{4 \times 14}{63} \right)^{0.6} = 50 \times 0.93 = 46.6$



Assessment – Peer Assessment Scaling Factor





Assessment – Reports

- *Each student will be submitting two major reports.*
- *Each team will be submitting two group reports*

Design Overview (*Pass/Fail – Due Week 5*)

4 page team report which is an overview of the product design. This report will identify which team members are responsible for each subsystem.

Design Report (*10% – Due Week 5*)

10 page individual report which describes the sub-systems you are responsible for, and your project plan.



Assessment – Reports (cont.)

Final Design Overview (*Pass/Fail – Due Week 13*)

4 page team report which is an overview of the final product and its design. This report will identify which team members are responsible for each sub-system.

Design Report (*10% – Due Week 13*)

10 page individual report which describes the sub-systems you were responsible for, and your project reflections.



Assessed Team Meetings

- Each team will have five assessed team meetings throughout the semester (best four of five count).
 - Meetings start in Week 3 and are held fortnightly.
- Each team member will have the following roles:

Role	Assessment	Tasks
ScrumMaster	2.5% + 2.5% (Participant + SM Duties)	<ul style="list-style-type: none">• Facilitate the meeting
Scribe	2.5% + 2.5% (Participant + Minutes)	<ul style="list-style-type: none">• Take notes during the meeting and create a set of minutes.
Participant	2.5%	<ul style="list-style-type: none">• Report on goals.• Set new goals.



Team Allocations

- *ENGG3800 - First allocation will be available Monday of week 2.*
- *METR3800 – First allocation will be available by the first prac session.*



Labs and Lab Usage

- ENGG3800 - You will require a ITEE swipe card to access the labs. See the ITEE office or [this link](#) for information. To receive a swipe card, you will need to pay a \$20 deposit.
- METR3800 – You will need a swipe card – same process as in METR2800
- **YOU MUST FILL OUT THE [ONLINE OH&S FORM](#) BEFORE YOU CAN SWIPE IN TO THE LABS.**
 - See the link ‘Safety Declaration Form’ on the left-hand menu bar.
 - METR Students there will be a lab induction on Thursday of Week 2



Labs and Lab Usage

- You have 24 hour access to your labs.
- This is a huge privilege.
- *You will lose this privilege if you eat, drink, sleep, or partake in any other nonsense that breaks the laboratory rules. There will be no first time warnings.*
 - This includes water bottles!



Parts Ordering

- Each team has been allocated **\$160** of spending money (but your product must be worth \$100 or less).
- Our suppliers are: [Farnell](#), [RS](#), [Soanar](#), and ITEE's [Electronics Workshop](#).
- Parts from Farnell, RS, and Soanar must be ordered through our Purchasing Manager (Steve Wright). Orders must be submitted by 7am on Wednesdays. A strict format for orders is required - full details for ordering can be found [on the course website](#).
- Parts from the Electronics Workshop can be purchased and collected at any time*.



Printed Circuit Boards (PCBs)

- Our PCB runs are organized by Steve Wright and manufactured externally.
- Four batches will be manufactured this semester. Submissions for each batch are due at 8am on Monday of weeks 4, 6, 8 and 10.
- Your PCB files must be able to be opened and manipulated in Altium Designer 6 (Winter 09 edition).
- PCB Pricing has changed! *Rounding occurs after the area has been calculated.* Eg, 0.5×4 " PCB will be $2 \times \$2.20 = \4.40 .
- All PCB details can be found [on the course website](#).



Mechanical Design

- Our Mechanical Design submission are organized by Doug Malcolm.
- Four batches will be manufactured this semester. Submissions for each batch are due at 8am on Monday of week's 4, 5, 7 and 9. (1 week before PCB submissions)



Plagiarism

- Do not copy from unreferenced sources or other teams.
- Do not engage in collusive behaviour. If you're having problems with something, ask a tutor.

Academic Merit

- Your work must contain academic merit. You cannot rely solely on referenced material, your work must add something to the reference material. If you're in doubt about something, see a tutor.
- If you are using material from textbooks, online material, datasheets, team-mates etc you must **reference** it. You should include your references in relevant reports, schematic files and code comments.



The Product – ENGG3800





The Product – METR3800

- Your design team has been asked to develop an original Micromouse to compete in a micromouse competition.
- The objective of the competition is to build a robot which can negotiate a specified maze in the shortest time. A robot participating in this competition is termed a 'Micromouse'.
- A Micromouse shall be self contained. It shall not use an energy source employing a combustion process.
- The basic function of a Micromouse is to travel from the start square to the destination square in the maze
- Further details are on blackboard