

EEE6480

Research techniques & thesis
preparation

MSc project EEE6600, EEE6602
or COM6915

Dr Kristian Groom

Tuesdays 5pm in Mappin-LT03

11th, 18th, 25th Feb and 4th, 11th March
(teaching weeks 1– 6)

Syllabus

1. Introduction, timeline, submission process, assessment, unfair means, getting started
2. Project/time management – Gantt chart, risk register
3. Interim report – structure, literature review
4. Final dissertation, scientific writing, structure
5. Oral and poster presentation skills
6. Experimental uncertainty

Recommended Books

- Barrass , *“Scientists Must Write”*, Chapman and Hall
- Sides, *“How to Write and Present Technical Information”*, CUP
- Cain, *“The Basics of Technical Communicating”*, American Chemical Society
- Cooper, *“Writing Technical Reports”* , Penguin
- van Emden, *“A Handbook of Writing for Engineers”*, Macmillan
- Turk , *“Effective Speaking”*, Chapman and Hall

English language skills

The following sessions taught by our English Language Teaching staff member specifically for our MSc students with poor English:

- 3 × 1.5 hour sessions on "Preparation for project Interim Report" beginning Wednesday 16:00-17:30. Start in week 2 (19th Feb) for 3 weeks in Portobello Centre, room B57C.
- There will also be some Writing Advisory Sessions (1:1 appointment based sessions) on Weds 7th May. (Peter Judd will announce these in detail nearer the time).

- More general English writing or speaking classes :
<http://shef.ac.uk/eltc/languagesupport/els>
- And the English Language Teaching Centre's Writing Advisory Service
(one-to-one help with written work by appointment) is available:

<http://shef.ac.uk/eltc/languagesupport/writingadvisory>

Timeline

Date	Event/process
Mid- November 2013	Projects available for selection
End November 2013	Project selection deadline
Early Jan 2014	Project allocation
2 nd semester weeks 1-6	EEE6480 seminar series
Feb – April 2014	Literature review, background theory, initial learning, project plan
30 th April 2014	Submission of interim report
15 th June 2014	Start full-time project
29 th August 2014	Thesis deadline
5 th September 2014	Poster session

Interim report mark scheme (EEE6480)

- **Supervisors interim report mark sheet:**
(**70%** of EEE6480)
 - A1) Literature review 40%
 - A2) Project plan 40%
 - A3) Overall presentation/structure 20%
- **2nd markers mark sheet:**
(**30%** of EEE6480)
 - C1) Oral presentation of project objectives/theory/context/progress (50%)
 - C2) Ability to answer questions posed (50%)


online marking, feedback via supervisor

Suggested marking guidelines

	Mark range					
Criterion	0 - 3	4	5	6	7	8 - 10
A1) Literature review	Little or irrelevant literature review. Inappropriate referencing, poor sources	Insufficiently thorough or relevant literature review. Refs not referred to or formatted appropriately	Reasonably thorough review of relevant literature. Inconsistent Referencing	Sufficient review of relevant literature, but could be better. Correct referencing.	Comprehensive well written review of relevant literature. Well referenced.	A concise and informative critical review of the state of the art. Many references well used.
A2) Project plan	Poor or absent project plan, no risk assessments. No milestones	Very basic project plan, poorly composed, unfeasible, or poorly described. Incomplete risk assessments. No milestones	Adequate project plan. May be too brief or unrealistic. Overly brief risk assessments. Some milestones identified	Sufficient and realistic project plan, meeting project objectives. Good risk assessments and milestone identification	Very good, well considered project plan and intelligent risk assessments and mitigation strategies. Sensible milestones.	An excellent project plan with measurable milestones and perceptive risk assessment and management strategies
A3) Overall presentation	Hard to read, no structure, poor quality, Difficult to follow aims/objectives	Just adequate. Careless formatting. Flawed structure	Reasonable presentation. Some deficiencies (poor diagrams, formatting)	Good and effective presentation, but could be more incisive. Easy to follow aims and objectives	Very good presentation. Correctly formatted. Concise & informative aims and objectives	Excellent. Sensible structure and format. Easy and informative to read. Model statement of aims and objectives
C1) Grasp of the project material	Little or no grasp of the project objectives, context or theory. Many technical errors. Unable to answer questions.	Inadequate or very basic grasp of project objectives, theory and context. Technically weak. Able to answer simple questions only.	Reasonable account of project objectives & background. Some technical deficiencies. Willing to have a go at answering questions.	Good grasp of project objectives and theory. Technical arguments mostly good. Confident and mostly competent answers to questions.	Comprehensive grasp of project objectives, theory & context. Technical arguments sound. Confident and competent answers to questions.	Excellent grasp of project objectives. Lucid technical arguments. Able to discuss any aspect of the project expertly.
C2) Presentation of their project summary	Slides confusing, virtually empty or wrong. No introduction and conclusions. Poor quality slides, disorganised and incoherent delivery.	Adequate material but carelessly formatted. Slides hard to interpret. Mumbling and disorganised delivery. Was often lost.	Reasonable presentation. Slides OK but some format issues - graph axes, font size, colour scheme. May have depended heavily on notes	Good and effective presentation, but could be more incisive. Easy to understand what is being done.	Very good presentation. Concise & informative explanation, good use of visual aids. Enjoyable.	Excellent structure and format. Expertly delivered presentation of all required aspects.

Project module marks

- **Dissertation (scaled to 70 marks):**

- Products (20 marks)
 - Processes (20 marks)
 - Evaluation (20 marks)
 - Use of sources and resources (20 marks)
 - Presentation (20 marks)
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+ General ability (30 marks)

+ Continuous assessment (10 marks)

+ Poster presentation (10 marks)

- Total 120 marks scaled down to 100%

Nb: COM6915 marked slightly differently, but still 60 credits

Suggested marking guidelines – dissertation & poster

	Mark scale					
Criterion	0 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 20
D1) Products	Minimal or no achievement - all or most objectives missed without reason	Work was done but it failed to meet aims. Experiments compromised by failure to plan. Many excuses offered.	Reasonable progress - will have met some objectives but parts incomplete	Good progress at meeting objectives - most difficulties overcome - some creativity	Very good progress - objectives met or exceeded - any difficulties overcome	Excellent progress - problems overcome - extra objectives created and met.
D2) Processes	Has failed to grasp major aspects of the work - limited ability even with guidance	Very superficial understanding of the project aims and substance. Needed guidance on virtually all issues but did not develop	Reasonable analysis and understanding of most parts - competent design and testing but limited justification of design choices or explanation of experimental processes.	Good analysis and understanding of most aspects - some originality - appreciates consequences of decisions.	Very good analysis and interpretation with original parts and full awareness of the effects of decisions. All design decisions and experimental methods fully justified.	Expert analysis and understanding - can educate supervisor - highly original and publishable work.
D3) Evaluation	No attempt at interpretation of the few (if any) results - discussion absent, naive or irrelevant.	Superficial attempt to explain results, measurements and theory probably for different conditions - nothing quite properly tied up.	Reasonable interpretation but some flaws - reasonable further work suggested. Perhaps experimental results not compared with theory or design performance not compared with spec.	Interpretation makes full use of results - good further work suggested - critical evaluation compared to initial objectives.	Evidence based arguments and imaginative further work suggestions presented. Achievements evaluated critically against objectives or specs.	Excellent critical evaluation of project. Suggestions for further work imaginative and perceptive. Work of publishable standard.
D4) Use of sources and resources	Poor use of relevant literature, available computing and/or experimental tools.	No evidence of understanding of literature. Weak in application of computational and experimental tools	Adequate methodology - available tools have generally been used properly.	Competent use of available tools and sound methodology	Very good and creative use of tools and resources. Sound and well justified methodologies	Excellent and probably innovative use of tools and, perhaps, creation of new tools.
D5) Presentation	Report hard to read - no structure - poor use of language - poor referencing - very poor quality diagrams.	Report readable but no sensible formatting or structure, poor diagrams that missed the point	Readable and coherent report - reasonable diagrams, structure and referencing.	Readable and interesting - good diagrams, structure and referencing.	Well written and structured, easy to read and informative. Diagrams relevant and of good quality.	Excellent presentation - concise and informative. Structure, diagrams, referencing, use of English all outstanding
	1 - 3	4	5	6	7	8 - 10
Poster	Non - attendance or minimal effort. Disorganised layout; cannot explain poster contents	Poor poster layout, font too small, diagrams illegible, answers attempted but difficult to understand	Reasonable poster layout - able to answer some questions	Some good features in poster layout. Questions mostly answered in a comprehensible way.	Very good poster layout. Questions answered at an appropriate level in a clear and concise way.	Excellent poster layout. Masterful performance in answering questions and talking around the subject.

Project continuous assessment

2) 10 mark contribution to project module (supervisor only):

- performance 5 marks
- theory/methodology 5 marks

Criterion	0 - 3	4	5	6	7	8 - 10
Performance to date	No progress. Requires total guidance	Limited progress. Little independence shown.	Reasonable progress. Some ideas and ability to work independently.	Good progress. Works with little guidance. Contributes ideas	Very good progress. Suggests & evaluates ideas	Excellent progress. Self guiding. Leads discussions, creates & evaluates ideas. Makes decisions.
Theory / methodology	Little or no grasp of relevant theory or methods	Basic understanding, failed to grasp major aspects of theory or methodology	Adequate understanding of relevant theory and methods	Good grasp of relevant theory and methods, but could be better	Very good grasp of relevant theory and methods	Masterful theoretician. Can lead supervisor through difficult ideas. Accomplished experimentalist.

Supervisor's assessment of ability

- **Understanding:** 10 marks

Understanding the problem and its requirements, grasp of the topic, theoretical approach

- **Practical skills:** 10 marks

Approach to work, use of design tools, experimental verification, technical competence, application of engineering principles, elegance of solutions

- **Self-reliance & initiative:** 10 marks

Diligence, time management, development of new ideas, application of novel engineering design principles

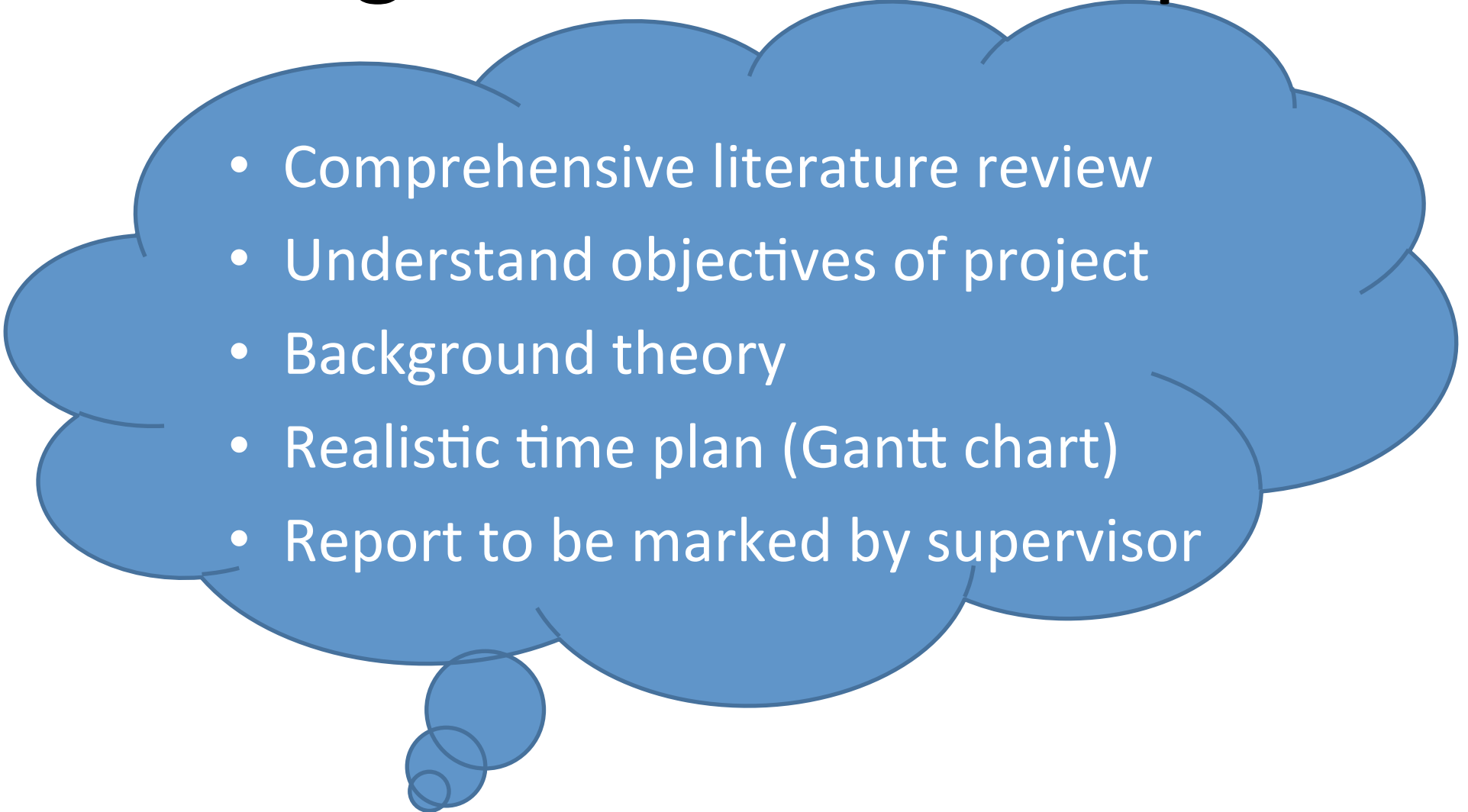
General ability

Criterion	0-3	4	5	6	7	8-10
understanding	has failed to grasp major aspects of the work	overall appreciation of project but understands few of its parts	reasonable understanding of most parts but difficulty in evidence based reasoning	good understanding of most aspects and appreciates consequences of decisions	very good understanding of all aspects with full awareness of effects of decisions	expert understanding and can educate supervisor
practical skills	limited E & D skill even with guidance	some E & D skill but can't solve problems even with guidance	competent E & D skills but lacks interpretative flair	solid practical E & D performance, few mistakes, good interpretation	designs good expts - sound methodology - excellent interpretive skills	designs novel expts – technically sound - . exceptional flair for expt. and theory
Self-reliance & initiative	cannot successfully complete tasks given under guidance – minimal contribution	task-by task guidance required - tasks minimally done no independence shown. contributes occasionally with simple suggestions that have not been thought through	performs well with weekly planning guidance contributes some novel ideas - occasionally tries out ideas on own initiative	performs well with minimal general guidance has ideas and often independently develops and evaluates them - can develop given ideas	works mainly without guidance and can defend course of action able to drive the project - frequently suggests and evaluates novel ideas	leads the project - works entirely without guidance and can defend decisions able to drive the project - continuously suggests and evaluates novel ideas

Submission process – interim and final report

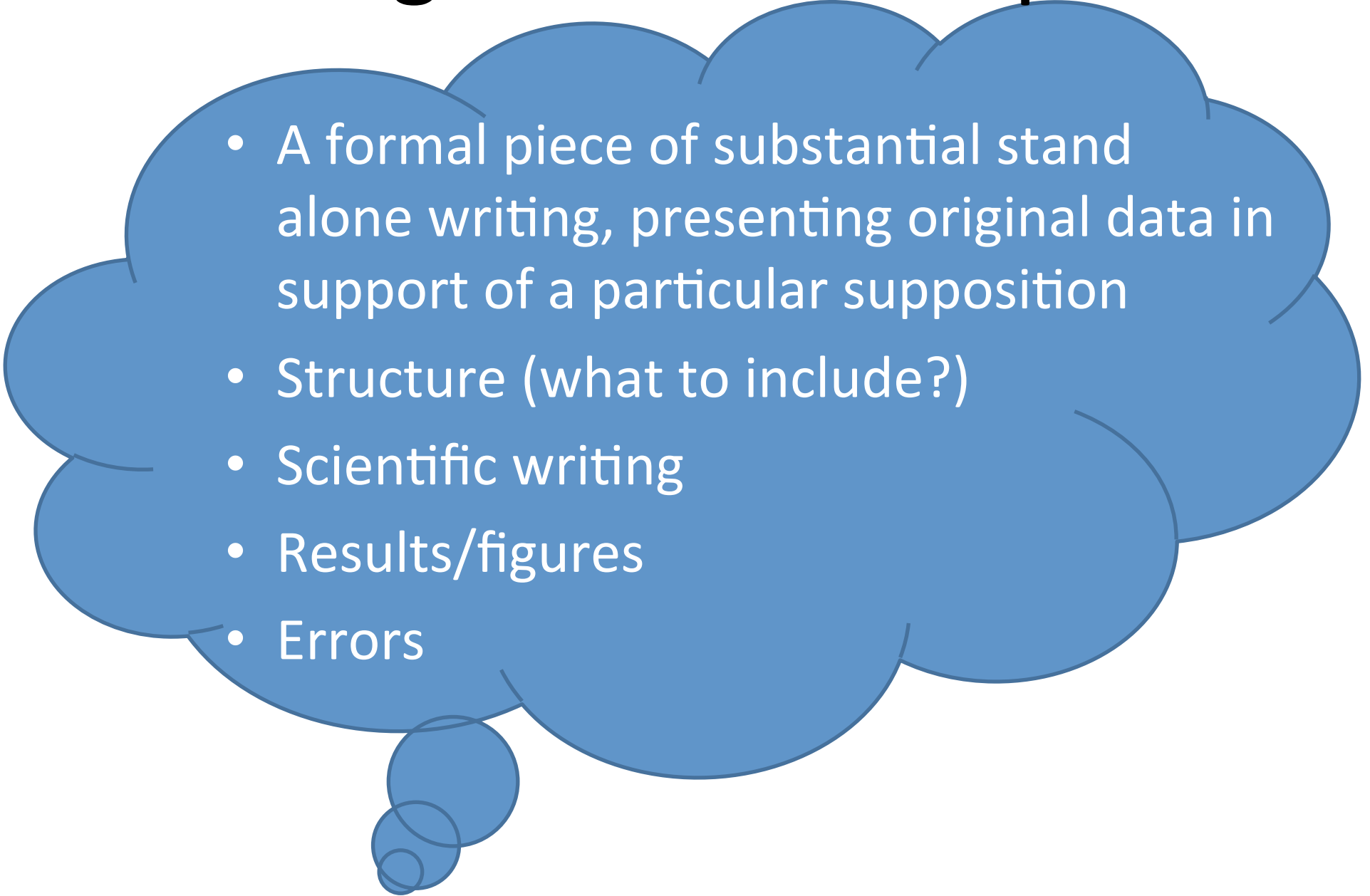
- 1 hard copy of interim report and 2 hard copies of final thesis to be submitted to EEE office.
- Late submission results in 5 marks being deducted per day!
- Electronic copies of the interim report and the final dissertation should also be submitted to the EEE TurnItIn and online marking system before the deadline.
- **Failure to submit electronically → zero → no MSc!**

Thoughts on interim report

- 
- Comprehensive literature review
 - Understand objectives of project
 - Background theory
 - Realistic time plan (Gantt chart)
 - Report to be marked by supervisor

If a student fails to submit their interim report they cannot proceed to the project

Thoughts on final report

- 
- A formal piece of substantial stand alone writing, presenting original data in support of a particular supposition
 - Structure (what to include?)
 - Scientific writing
 - Results/figures
 - Errors

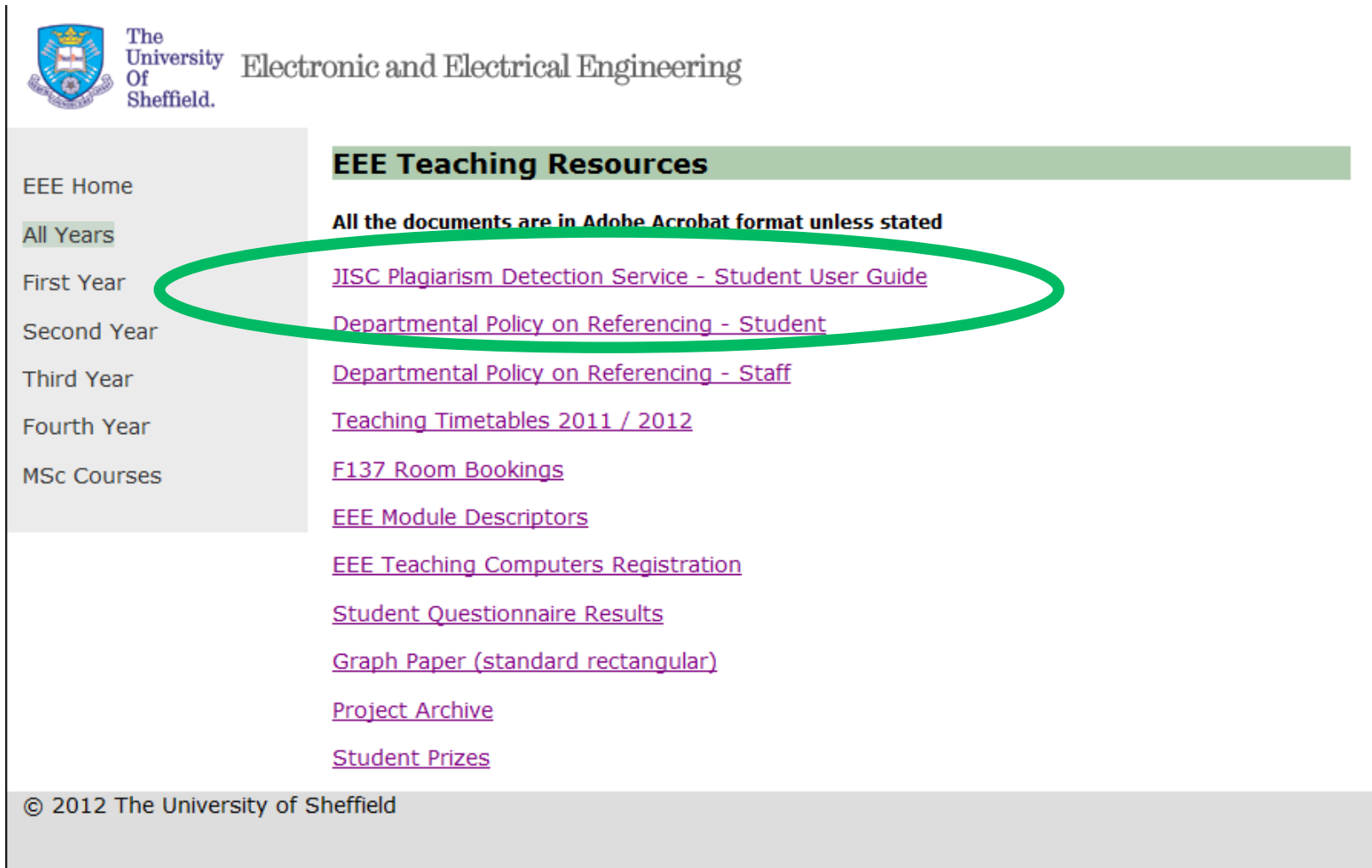
Plagiarism

- TurnItIn - pattern matching routine. Human interpretation required. Matched text highlighted, referenced to the source text. Click on the coloured section in the report to see the source in context, or click on a source to see that in full.
- a number of matches to common English phrases like, “It can be seen from the graph that” are ignored.
- What is the probability of a student coming up with *exactly* the same form of words by pure chance? If probability is very small then student has probably copied.
- Length of matching passage a factor –using ‘technical’ terms is not a problem, but cutting-and-pasting sections is.
- Copied passages which have been laundered – a few words changed to try to camouflage the origin of the passage.

http://hercules.shef.ac.uk/eee/teach/resources/info/departmental_policy_on_referencing-student.pdf

More on plagiarism

EEE homepage → Information for staff/students → EEE teaching resources →



The University of Sheffield Electronic and Electrical Engineering

EEE Home

All Years

First Year

Second Year

Third Year

Fourth Year

MSc Courses

EEE Teaching Resources

All the documents are in Adobe Acrobat format unless stated

[JISC Plagiarism Detection Service - Student User Guide](#)

[Departmental Policy on Referencing - Student](#)

[Departmental Policy on Referencing - Staff](#)

[Teaching Timetables 2011 / 2012](#)

[F137 Room Bookings](#)

[EEE Module Descriptors](#)

[EEE Teaching Computers Registration](#)

[Student Questionnaire Results](#)

[Graph Paper \(standard rectangular\)](#)

[Project Archive](#)

[Student Prizes](#)

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Exercise: Writing a summary

- Read the articles all the way through without making any notes. Gives an overview of the article's content and structure.
- Write one or two sentences outlining what the article is about.
- Re-read the articles, noting down the main points in each one, in your own words, as you come to them. These points will often be supported by facts or arguments - note these as well.
- Prioritise the points you have noted
- Write summary **in your own words**.
 - It should have an introductory paragraph to tell the reader what the article is about.
 - Order the points and supporting arguments.
 - Draw ideas together with a brief conclusion

Project: Getting started

1. **Familiarise yourself** – labs, stores, key people (RAs, technicians), lab safety/evacuation procedures.
2. **Maintain a proper lab book** – keep good records of experiment/simulation. Write everything down (worked or not). Write all parameters used. Include thoughts/discussions.
3. **Establish good reference keeping practices** – keep a working bibliography (referencing).
4. **Plot results/compile record of progress** – helps supervision.
5. **Deal with problems** – Show initiative but seek guidance where appropriate (especially if expensive!)

And finally.....Supervision

Supervision will be very different!

Amount/type of supervision depends on research group size:

- **Start up:** young supervisor/new group – frequent intensive supervision. Over ambitious, simplify later. Ground breaking, but could be long set-up times.
- **Up and running:** money to spare but supervisor has less time available. RAs/PhDs. Previous results. Impact.
- **Empire:** very large group, several RAs/PhDs. May not see supervisor often. But lots of equipment, many fall back options.