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**COURSE DETAILS**

**Units of Credit**

12

Masters of Biomedical Engineering (Thesis C) by Coursework (full time) is over 1 session.

Thesis A and B are over 2 consecutive sessions. Masters of Biomedical Engineering by Coursework (Thesis C, 6 units per session) is also over 2 consecutive sessions.

**Course Coordinator**

Robert Nordon  
email: r.nordon@unsw.edu.au  
office: 515c  
phone: 93850559

**INFORMATION ABOUT THE COURSE**

**Presumed knowledge and skills**

Students in the dual (formerly concurrent) degree program enrol in a thesis after completion of 168 units of credit, usually in their 4th year. Masters thesis C students (BIOM9914, BIOM9020/1) should have a background in the relevant engineering discipline for their project. Undergraduate students who apply for a Masters thesis C should have a WAM of at least 65%. Their application for admission into BIOM9914, BIOM9020/1 should be approved by their thesis supervisor and supported by a project description.

**How this course relates to other courses**

For students enrolled in the undergraduate thesis in a Biomedical Engineering dual (formerly concurrent) degree programs, there are specific requirements of their undergraduate school that must be met. Students enrolled in Electrical Engineering and Telecommunications will have their thesis examined within that school. For other undergraduate schools the interim report and final thesis will be examined by the Graduate School of Biomedical Engineering. Material Science, Mechanical Engineering, Mechatronic Engineering and Chemical Engineering students, will be required to present their work in a seminar at the Graduate School of Biomedical Engineering in Week 13 of thesis B. However, students from Bioinformatics, Software Engineering, Computer Science and Engineering, Electrical Engineering and Telecommunications, will present their work in a seminar run by their respective schools.
<table>
<thead>
<tr>
<th>Program</th>
<th>Thesis A</th>
<th>Thesis B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical and Mechatronic Engineering</td>
<td>BIOM5001</td>
<td>BIOM5003</td>
</tr>
<tr>
<td>Electrical Engineering and Telecommunications</td>
<td>BIOM5910</td>
<td>BIOM5911</td>
</tr>
<tr>
<td>Computer Science and Engineering</td>
<td>BIOM5950</td>
<td>BIOM5951</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>BIOM5930</td>
<td>BIOM5932</td>
</tr>
<tr>
<td>Bioinformatics</td>
<td>BIOM5940</td>
<td>BIOM5941</td>
</tr>
<tr>
<td>Software Engineering</td>
<td>BIOM5960</td>
<td>BIOM5961</td>
</tr>
<tr>
<td>Material Science and Engineering</td>
<td>BIOM5910</td>
<td>BIOM5911</td>
</tr>
<tr>
<td>Masters of Biomedical Engineering by Coursework (Thesis C, 2 sessions)</td>
<td>BIOM9020</td>
<td>BIOM9021</td>
</tr>
<tr>
<td>Masters of Biomedical Engineering by Coursework (Thesis C, 1 session)</td>
<td>BIOM9914</td>
<td>(over 1 session)</td>
</tr>
<tr>
<td>Units of Credit</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**COURSE AIMS**

The thesis provides an opportunity for the student to bring together engineering principles learned over their previous years of study and apply these principles to innovatively solve problems such as the development of a specific design, process and/or the investigation of a hypothesis. Thesis projects must be complex, open-ended problems that allow room for student creativity, and the acquisition, analysis and interpretation of results. There must be multiple possible solutions or conclusions at the outset and sufficient complexity to require a degree of project planning from the student. The thesis requires the student to formulate problems in engineering terms, manage an engineering project and find solutions by applying engineering methods. Students also develop their ability to work in a research and development environment.

The Biomedical Engineering Thesis or Masters (Thesis C) project aims to analyse or solve biomedical problems by applying engineering techniques. Problems to be addressed relate to basic or applied biomedical research or development of medical devices, processes or software. The thesis project is obligatory for all students of the dual (formerly concurrent) Bachelor of Engineering/Master of Biomedical Engineering program, and is undertaken in years 4 and 5 of the degree.

The Biomedical Engineering Masters Project (Thesis C) is open to dual (formerly concurrent) degree students who have successfully completed Thesis A and B, or postgraduate students enrolled in the Masters of Biomedical Engineering by Coursework (Program code 8660).

**COURSE LEARNING OUTCOMES***

At the conclusion of this course, students should be able to:

1. Develop a design or a process or investigate a hypothesis following industry and professional engineering standards. (7, 8, 9, 10)
2. Critically reflect on a specialist body of knowledge related to their thesis topic. (3)
3. Apply scientific and engineering methods to solve an engineering problem. (7)
4. Analyse data objectively using quantitative and mathematical methods. (2, 7, 8)
5. Demonstrate oral and written communication in professional and lay domains.
   (12)
6. To solve biomedical problems by applying 1-5.

*Mapping to Learning Outcomes in brackets

**BE (HONS) PROGRAM LEARNING OUTCOMES**

1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
2. Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.
4. Discernment of knowledge development and research directions within the engineering discipline.
5. Knowledge of engineering design practice and contextual factors impacting the engineering discipline.
6. Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.
7. Application of established engineering methods to complex engineering problem solving.
8. Fluent application of engineering techniques, tools and resources.
10. Application of systematic approaches to the conduct and management of engineering projects.
11. Ethical conduct and professional accountability.
12. Effective oral and written communication in professional and lay domains.
13. Creative, innovative and pro-active demeanour.
14. Professional use and management of information.
15. Orderly management of self, and professional conduct.
16. Effective team membership and team leadership.
TEACHING STRATEGIES

Suggested approach to learning

- The student will rely on developing an independent and collaborative learning approach. Research questions are often open-ended and highly specialised, so the student will learn most by one-to-one mentoring provided by the supervisor and their research team. Students enrolled in the dual (formerly concurrent) degree program are advised to read the course outline provided by their undergraduate school.

- You will learn most of your skills from PhDs and Post Docs in your lab. We encourage you to attend lab meetings to get and know lab personnel.

Lectures

- Introductory lectures (attendance optional) will be provided to inform students on how to write their thesis (see below), as well as special topics including experimental design and statistical methods.

ASSESSMENT PROCEDURE

Thesis A

1. Interim report (80%)
   a. Reviewing the work of others (70%)
   b. Articulating a research question and a plan (20%)
   c. Document presentation (10%)

2. Project dependent deliverable work (20%)
   a. Attendance at lab meetings
   b. Amount of work and engagement with problem
   c. Intellectual contribution
   d. Risk assessment (when relevant)

Thesis B

1. Written report (80%)
   a. Literature review/background and putting the results in context (20%)
   b. Execution of the research project, quality of analysis, discussion of results (50%)
   c. Conclusions and value added (20%)
   d. Document presentation (10%)

2. Two forms of dissemination in addition to the thesis document itself (20%)
   a. Oral presentation is obligatory
   b. Additional form includes poster presentation, other media, practical demonstration, conference abstract, web page etc.
Thesis C

1. Written report (100%)
   a. Literature review/background and putting the results in context (20%)
   b. Execution of the research project, quality of analysis, discussion of results (50%)
   c. Conclusions and value added (20%)
   d. Document presentation (10%)

School responsible for assessment

<table>
<thead>
<tr>
<th>Program</th>
<th>Reports and thesis</th>
<th>Seminar/Poster/Demo</th>
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</thead>
<tbody>
<tr>
<td>Mechanical and Mechatronic Engineering</td>
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<td>GSBME</td>
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<tr>
<td>Chemical Engineering</td>
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<td></td>
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<tr>
<td>Material Science and Engineering (12 unit project)</td>
<td></td>
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</tr>
<tr>
<td>Thesis C</td>
<td></td>
<td>Undergrad school</td>
</tr>
<tr>
<td>Bioinformatics</td>
<td></td>
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<tr>
<td>Software Engineering</td>
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<tr>
<td>Computer Science and Engineering</td>
<td></td>
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</tr>
<tr>
<td>Electrical Engineering and Telecommunications</td>
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</tr>
</tbody>
</table>

Assessment Due Dates for GSBME

1. Thesis A                         Friday week 13 (4 pm)
2. Thesis B                         Friday week 13 (4 pm)
3. Thesis C (part 1)                Friday week 13 (4 pm)
4. Thesis C                         Friday week 13 (4 pm)

Thesis B GSBME Seminars (Chemical Engineering, Material Science and Engineering, Mechanical and Mechatronic Engineering) will be held on Friday Week 13. The Seminar will be 20 minutes (15 minutes talk/ 5 minutes questions). They will be held in the Seminar Room Level 5 Samuels Building.

Thesis B GSBME posters (Mechanical /Mechatronic Engineering, Chemical Engineering, Material Science and Engineering) will be presented at the BESS Industry Night (Cicada Innovations, Australian Technology Park, Redfern) on Tuesday 22nd May.
Guidelines for writing your thesis

The thesis content will be assessed according to the stated thesis aims which may be a) experimental or simulation based b) design or c) critical reviews. The assessment weightings are shown below. Please note that these are only assessment criteria. The thesis structure outline is entirely up to you as long as you clearly address the following:

1. Introduction, background and aims
   This will include i) the biomedical problems you are addressing and their relevance ii) past work addressing this problem and other relevant background information and iii) hypothesis and/or aims for this project.

2. Methodology
   a) Experimental or simulation based projects
   Detail the methods and techniques you used. Provide enough information so that others may replicate your methods. Explain how the methods were used to generate the data in this thesis. Provide statistical methods if they were used to analyse data. Briefly explain how the methods address the hypotheses or aims of this project.

   b) Design projects
   Detail the software, instrumentation and manufacturing methods that were used to create the design. Provide a specification for the devices or software, as well as the intended methods for testing how well the design meets the specification. Provide statistical methods if they were used to analyse design performance.

   c) Critical reviews
   Outline the methodology that was used to critically review the field of research e.g., databases, interviews, patent searches

3. Research Outcomes
   a) Experimental or simulation based projects
   Provide a summary of your results including statistical analysis. Clearly explain how your results were obtained using experimental methods. You will also need to submit the raw data to your supervisors (lab books, data files, etc). Note that you can submit additional data files (200MB limit)

   b) Design projects
   Provide designs as well as experimental or simulated data that tests how well the design meets specification. Provide a summary of your results including statistical analysis. Clearly explain how your results were obtained using experimental methods. You will also need to submit the raw data to your supervisors (lab books, data files, etc.). Note that you can submit additional data files (200MB limit)

   c) Critical Reviews
   Provide an in depth critical analysis of the field. The review will need to be an up to date and comprehensive analysis of all of the literature.
4. Discussion and Conclusions

a) Experimental or simulation based projects:

Critically evaluate the methods and results of your thesis. This includes comparing your results to those obtained in the literature. Interpret your data using statistical inference or simulation validation methods, discussing how well your research addresses stated aims and hypotheses and recommend future studies. Also comment on the novelty and utility of your research and its outcomes.

b) Design projects

Critically evaluate your design making reference to the design specification and measurement of performance. Compare your design with competing technologies. Where appropriate, note how well your devices or software has complied with industry standards, for example what testing would be required for registration by TGA or FDA. Also recommend future design improvements. Comment on the novelty and utility of your design. Is it worth patenting?

c) Critical reviews

Summarise the field making reference to gaps in knowledge that may be addressed by future research and development.

5. References and Overall Presentation

Marks will be deducted for typographical errors, incorrectly labelled graphs, poor thesis structure, incorrect referencing etc.
**RUBRICS FOR THE MARKING OF THESIS A**

**Criterion 1: Reviewing the work of others (70%)**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark</th>
<th>Brief description</th>
<th>Longer explanation / examples</th>
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</thead>
<tbody>
<tr>
<td>Fail</td>
<td>0-49</td>
<td>Deficient</td>
<td>Deficient work may be characterised by a number of features, including inappropriate reliance on sources not peer reviewed (such as the internet), not reviewing what should be the core of the literature in a particular area, or not reviewing any recent work (within, for example, the last 5 years although this will depend somewhat on the field).</td>
</tr>
<tr>
<td>Pass</td>
<td>50-64</td>
<td>Adequate</td>
<td>The literature reviewed is sufficient to inform the proposed research, although it is likely that further review will be required as the work progresses. What distinguishes work at this level from work at the next level up is quantity: an adequate review of the literature sketches enough that the reader can see what the picture is about, but neglects significant aspects. ie, are there significant holes in this review?</td>
</tr>
<tr>
<td>Credit</td>
<td>65-74</td>
<td>Solid</td>
<td>The most significant areas of literature relevant to the proposed work have been reviewed. There are no major &quot;holes&quot;. What is generally missing in this band, but present in higher quality work, is the student showing that they understand the conceptual relationships between the different reviewed works.</td>
</tr>
<tr>
<td>D</td>
<td>75-84</td>
<td>Solid, and linked</td>
<td>The most significant areas of literature relevant to the proposed work have been reviewed and the student has clearly identified one or more knowledge gaps. The student will have shown that they understand the conceptual relationships between reviewed works and between reviewed works and the student's research project. ie, the student makes intellectual connections between the different parts of the review and puts their work in context.</td>
</tr>
<tr>
<td>HD</td>
<td>85-100</td>
<td>Of review paper quality</td>
<td>In addition to meeting the quality at the previous band – &quot;Solid, and linked&quot; – the student has made a critical assessment of the literature in the context of their research project to a depth and breadth that is of the quality that could be anticipated to be seen in a journal review paper.</td>
</tr>
</tbody>
</table>
**Criterion 2: Articulating a research question, plan and thesis outline (20%)**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark</th>
<th>Brief description</th>
<th>Longer explanation / examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>0-49</td>
<td>Broad context missing.</td>
<td>The research question is not explained, and no clear demonstration of student understanding. Research plan is not present, or does not have sufficient detail to demonstrate they can successfully complete a thesis project. No thesis outline is presented (i.e., thesis chapter headings).</td>
</tr>
<tr>
<td>Pass</td>
<td>50-64</td>
<td>Broad context present. No specific plan.</td>
<td>Research question and plan are presented, but lack detail and a logical plan of investigation. There is enough of a plan to believe that the research project is feasible. Generic chapter headings may show no particular relevance to the research.</td>
</tr>
<tr>
<td>Credit</td>
<td>65-74</td>
<td>Broad context present. Specific logical plan.</td>
<td>Research question and plan are presented, and include some detail. There is enough of a plan to believe that the research project is feasible, and that student understands the resources and time required. The plan does not appear to be informed by the literature review – it sits largely separately to the literature review, it is not part of the narrative developed in the review. Thesis outline reflects the research plan, but lacks enough detail.</td>
</tr>
<tr>
<td>D</td>
<td>75-84</td>
<td>Broad context present. Specific logical plan. Plan fits the review narrative.</td>
<td>The plan fits within the narrative set out by the literature review – the student makes clear why the plan is developed this way in the narrow context of the reviewed literature. The research plan demonstrates a logical and feasible course of action. Realistic milestones have been set. Thesis outline that demonstrates a logical vision for the thesis.</td>
</tr>
<tr>
<td>HD</td>
<td>85-100</td>
<td>Broad context present. Specific and robust logical plan. Plan fits the review narrative.</td>
<td>The plan is robust and has provision for project variations and contingencies. The plan fits within the narrative set out by the literature review – the student makes clear why the plan is developed this way in the context of the reviewed literature. Thesis outline includes sub-sections, logical flow with a clear connection to the project plan and literature review.</td>
</tr>
<tr>
<td>Grade</td>
<td>Mark</td>
<td>Brief description</td>
<td>Longer explanation / examples</td>
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<tr>
<td>Fail</td>
<td>0-49</td>
<td>Impedes document reading</td>
<td>Presentation is poor to the extent that it impedes reading of the document. Examples include multiple inconsistent citation styles or incomplete citations, unintelligible grammar, figures or tables not labelled or badly inconsistent document formatting.</td>
</tr>
<tr>
<td>Pass</td>
<td>50-64</td>
<td>Poor formatting / document structure</td>
<td>Document is not at a professional level. Although figures and diagrams are labelled and references in text match reference list (and vice versa), formatting is unclear and inconsistent to the extent that the reader can lose track of the context when reading.</td>
</tr>
<tr>
<td>Credit</td>
<td>65-74</td>
<td>Poor judgement with respect to layout, possible padding</td>
<td>Appropriate use of section and sub-section heading structures. Figures and diagrams are labelled, formatting is consistent, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled. There may be superfluous material present, such as unnecessary, repetitive or unusually large figures, unnecessarily lengthy text, unusually wide margins, unnecessary appendices, etc.</td>
</tr>
<tr>
<td>D</td>
<td>75-84</td>
<td>Professional, may have issues with data presentation</td>
<td>Everything from above, plus a logical flow of sections, and appropriate judgement in the placement of data, tables or figures in the body of the work or the appendices. Figures and diagrams are correctly and clearly labelled, text spacing aids readability, consistent formatting, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled. Some of the graphical presentation of data is inappropriate - poor choice of axes, overcrowding, poor use of chart space etc.</td>
</tr>
<tr>
<td>HD</td>
<td>85-100</td>
<td>Professional, concise and readable</td>
<td>Everything from above, plus text is clear and concise. Graphical presentation of data is appropriate, clear and economical.</td>
</tr>
</tbody>
</table>
### RUBRICS FOR THE MARKING OF THESIS B AND C

#### Criterion 1: Lit review/background and putting the results in context (20%)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark</th>
<th>Brief description</th>
<th>Longer explanation / examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>0-49</td>
<td>Aims not clear</td>
<td>The student hasn’t done a good job explaining the research aims to the reader - I’m not really sure what this is about.</td>
</tr>
<tr>
<td>Pass</td>
<td>50-64</td>
<td>Reason for research not clear</td>
<td>I understand the project aims but the student has not made it clear to the reader how it is connected to the background - why is this aim being pursued? What is the hypothesis being tested? What is the broader significance?</td>
</tr>
<tr>
<td>Credit</td>
<td>65-74</td>
<td>Background clear - results not contextualised</td>
<td>The student makes the project background clear to the reader, and the significance of the research aim within a broader context. The student has not been able to take a step back and make an assessment of the significance of their results.</td>
</tr>
<tr>
<td>D</td>
<td>75-84</td>
<td>Background and aims are clear, context is incomplete</td>
<td>The student makes the project background clear to the reader, and the significance of the research aim within a broader context. The literature review is comprehensive but may be lacking depth of insight. The student has made a reasonable attempt to assess the significance of their results but it is either not realistic, or does not follow logically from the arguments presented.</td>
</tr>
<tr>
<td>HD</td>
<td>85-100</td>
<td>Background to research and significance of conclusions reached are clear</td>
<td>The student makes the project background clear to the reader, and the significance of the research aim within a broader context. The student also makes a realistic assessment of the significance of their results in this context. The literature review is comprehensive and insightful.</td>
</tr>
</tbody>
</table>
### Criterion 2: Execution of the research project, quality of analysis, discussion of results (50%)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark</th>
<th>Brief description</th>
<th>Longer explanation / examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>0-49</td>
<td>Clearly deficient</td>
<td>Work at this level is clearly deficient - in not addressing the stated project aims or in containing major problems that the student should reasonably have been aware of but did not address in the thesis.</td>
</tr>
<tr>
<td>Pass</td>
<td>50-64</td>
<td>&quot;Thin&quot; results, lacking intellectual engagement</td>
<td>The student has completed a body of work and presented some results but not succeeded in interpreting meaning from them (=intellectual input is largely absent from the discussion, which is essentially equivalent to observation of the results). Performance at this level may also indicate a lack of engagement with the project, sometimes evidenced as a &quot;thin&quot; or &quot;one-dimensional&quot; investigation characterised by attempted padding.</td>
</tr>
<tr>
<td>Credit</td>
<td>65-74</td>
<td>Several components to the research work, not coherently linked.</td>
<td>The student probably has a number of components to their research, such as literature, experiments, designs, simulations etc. They have interpreted meaning from the results but have overall not succeeded in linking the components of their research together as a coherent scientific story. There's no clear &quot;big picture&quot;.</td>
</tr>
<tr>
<td>D</td>
<td>75-84</td>
<td>Solid, coherent work, linking all the research components together into a consistent story.</td>
<td>At this level the student has assembled the pieces of their research project (which could include literature, different sets of experiments or measurements, simulations or analyses) into a coherent scientific story. Overall, you are left with a clear and convincing picture of what the research question was and what the answer is (along with its caveats). A student is generally not going to be able to achieve this if there are conceptual or methodological problems with their work, or if their review of literature is inadequate.</td>
</tr>
<tr>
<td>HD</td>
<td>85-100</td>
<td>Solid, coherent and consistent story PLUS something unexpected.</td>
<td>Student would have to have achieved as at the previous level but additionally has achieved something unexpected, thoughtful and original, such as a novel perspective or theory. This requires deep thinking of the student.</td>
</tr>
</tbody>
</table>
**Criterion 3: Conclusions, and value added (20%)**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark</th>
<th>Brief description</th>
<th>Longer explanation / examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>0-49</td>
<td>No value</td>
<td>There are obvious and substantial problems with what was presented – the work as it stands has no value because it doesn’t “hold water”.</td>
</tr>
<tr>
<td>Pass</td>
<td>50-64</td>
<td>No interesting results</td>
<td>The presented work is not at all challenging and yields entirely expected results – the student does not appear to appreciate this. The work doesn’t really add any significant value.</td>
</tr>
<tr>
<td>Credit</td>
<td>65-74</td>
<td>Minimal value</td>
<td>The presented work adds some value in some way – improvement of “local knowledge” such as techniques, additional data points in a larger design or hypothesis etc. The student worked well but did not push themselves harder to make any real new discoveries or interpretations, therefore the conclusions are limited and discussions of future work are predictable extensions of the work completed.</td>
</tr>
<tr>
<td>D</td>
<td>75-84</td>
<td>Will have wider impact when further work is done.</td>
<td>You are fairly sure that the results and discussion can eventually form the core of a research publication or change in industry practice (It may have already been included in a conference publication during the course of the thesis). However, further work will first be required – such as repeated experiments – before the work is truly sufficient. The student has included good, thoughtful discussion of limitations and provided insight into future work on this project or new avenues of research which could be followed.</td>
</tr>
<tr>
<td>HD</td>
<td>85-100</td>
<td>Will have wider impact now.</td>
<td>This is valuable work. This work can easily form the basis of a peer-reviewed journal publication, or other form of professional dissemination/presentation appropriate to the field (i.e. patent application, best practice document at a company, trade publication, workshop, etc.).</td>
</tr>
<tr>
<td>Grade</td>
<td>Mark</td>
<td>Brief description</td>
<td>Longer explanation / examples</td>
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<td>-------------------------------</td>
</tr>
<tr>
<td>Fail</td>
<td>0-49</td>
<td>Impedes document reading</td>
<td>Presentation is poor to the extent that it impedes reading of the document. Examples include multiple inconsistent citation styles or incomplete citations, unintelligible grammar, figures or tables not labelled or badly inconsistent document formatting.</td>
</tr>
<tr>
<td>Pass</td>
<td>50-64</td>
<td>Poor formatting / document structure</td>
<td>Document is not at a professional level. Although figures and diagrams are labelled and references in text match reference list (and vice versa), formatting is unclear and inconsistent to the extent that the reader can lose track of the context when reading. The structure of the document is poor or illogical, with little discernible flow.</td>
</tr>
<tr>
<td>Credit</td>
<td>65-74</td>
<td>Poor judgement with respect to layout, possible padding</td>
<td>Document is not at a professional level. Figures and diagrams are labelled, formatting is consistent, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled. Poor judgement has been exercised in placing data, tables or figures in the body of the work, and/or excessive figures/tables – some of which would have been better placed in an appendix or discarded. An attempt might have been made to &quot;pad&quot; the work or increase the page count using unnecessary, repetitive, or large figures, unnecessarily lengthy text, wide margins, etc. The language is not sophisticated or sufficient for describing the technical aspects clearly and rigorously, and there are disjointed aspects to the structure.</td>
</tr>
<tr>
<td>D</td>
<td>75-84</td>
<td>Professional, may have issues with data presentation</td>
<td>Document is at a professional level. Figures and diagrams are correctly and clearly labelled, text spacing aids readability, consistent formatting, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly labelled, and good use made of appendices. Some of the graphical presentation of data is inappropriate - poor choice of axes, overcrowding, poor use of chart space etc. Padding is not a feature of work at this level. The structure is well thought out and logical, and there is a good command of descriptive and technical language – descriptions and explanations have depth but clarity, and are concisely worded.</td>
</tr>
<tr>
<td>HD</td>
<td>85-100</td>
<td>Professional, concise and readable</td>
<td>Document is at a professional level. Figures and diagrams are correctly and clearly labelled, text spacing aids readability, consistent formatting, references in text match reference list (and vice versa), pictures are clear and attributed, sections clearly</td>
</tr>
</tbody>
</table>

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APPLICATION FOR EXTENSION FOR THESIS A OR B

You can apply for special consideration when illness or other circumstances interfere with your assessment performance.

Other applications for extension of submission of thesis reports (e.g. equipment breakdown, etc.):

1. The request for extension must come from the supervisor. That is, it is written by, and justified, by the supervisor.
2. Request must be lodged by week 9 of term.
3. Panel decision will be made by end of week 10.
4. The decision will be made by a panel – consisting of the HoS (or their nominee), Thesis Coordinator, and 1 other person.
5. Students should be alerted to the fact that this is not guaranteed, and thus should not rely on getting an extension.
6. Typically extensions are granted UP TO 3 weeks. The length of the extension need to be requested and justified by the supervisor. Panel will decide the length of time granted.

APPLICATION FOR EXTENSION FOR THESIS C

You can apply for special consideration when illness or other circumstances interfere with your assessment performance.

Other applications for extension of submission of thesis reports (e.g. equipment breakdown, etc.):

1. The request for extension must come from the supervisor. That is, it is written by, and justified, by the supervisor.
2. Request must be lodged by week 9 of term.
3. The decision will be made by the Thesis Coordinator
4. Students should be alerted to the fact that this is not guaranteed, and thus should not rely on getting an extension.
5. Typically extensions are granted UP TO 3 weeks. The length of the extension need to be requested and justified by the supervisor.

PROCEDURE IF YOU FAIL THESIS A OR B.


Fail in Thesis B – Students have three options.

1) re-enrol for Thesis A & B again, new project and supervisor
2) re-enrol for Thesis B again, same project - needs consent of an appropriate supervisor & student
3) Student does further work, re-submits thesis after a max of 6 weeks. Course mark capped at 50%. If still not satisfactory, then needs to re-enrol.
   
   a. This option is only available if the original mark was ≥40, OR if the student is in their last semester before graduation (regardless of the original mark).

**LATE PROCEDURE**

In all cases, applications for late submission can be applied for BEFORE the due date. This is at the discretion of the thesis coordinator, but should only be granted in exceptional circumstances. As per normal, students can also apply through myUNSW for special consideration.

For thesis A or B – 5 marks will be deducted off the thesis for every day late. Penalty applies until the marks for the course decrease to 50, and further lateness does not result in failure of the course, but might be a failure of the thesis (weekends count as days).

**Poster Presentation at Industry Night in Session 1**

It is compulsory for BIOM5003, BIOM5932 and BIOM5911 (Material Science) students to present their poster at the industry night run by GSBmE and the Biomedical Engineering Students Society (BESS) at the (Cicada Innovations, Australian Technology Park) in Week 12-13, Session 1. All students who had completed thesis B or a Masters thesis C in the prior 12 months can optionally present a poster. The prestigious GSBmE innovation award will be for the best poster presentation will be awarded on the night.

**Industry based projects**

We encourage students to seek partnerships with industry, so students can have a co-supervisor from industry. However if confidentiality is required, a confidential disclosure agreement (CDA) is obligatory. The agreement will protect the intellectual property rights of the industry partner, UNSW and the student. Students or academics are not authorised to sign confidential disclosure agreements on behalf of UNSW, and are advised to talk to the course coordinator and UNSW legal office to arrange for drafting and signing of the confidential disclosure or research agreement.

**RELEVANT RESOURCES**

All material will be provided via Moodle

**COURSE EVALUATION AND DEVELOPMENT**

Student feedback has helped to shape and develop this course, including feedback obtained from on-line evaluations as part of UNSW’s Course and Teaching Evaluation and Improvement (CATEI) process. exam.

**DATES TO NOTE**

Refer to MyUNSW for Important Dates.
PLAGIARISM

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise will have their names entered on plagiarism register and will be liable to disciplinary action, including exclusion from enrolment.

It is expected that all students must at all times submit their own work for assessment. Submitting the work or ideas of someone else without clearly acknowledging the source of borrowed material or ideas, is plagiarism.

All assessments which you hand in must have a Non Plagiarism Declaration Cover Sheet. This is for both individual and group work. Attach it to your assignment before submitting it to the Course Coordinator or at the School Office.

Plagiarism is the use of another person’s work or ideas as if they were your own. When it is necessary or desirable to use other people's material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:

https://student.unsw.edu.au/plagiarism

ACADEMIC ADVICE

- UNSW has a wide range of student support services. The resources listed below should be used by students needing assistance related to aspects of their overall University experience. Specific help regarding this course can be sought from the course coordinator.

  http://www.student.unsw.edu.au/
  https://my.unsw.edu.au/student/howdoi/HowDoI_MainPage.html
  http://www.counselling.unsw.edu.au/

- Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course coordinator prior to, or at the commencement of, their course, or with the Equity Officer (Disability). Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

- If you believe that your performance in an assessable component of the course has been affected by illness or another unexpected circumstance, you should make an application for special consideration as soon as possible after the event by visiting UNSW Student Central. Please talk to the course coordinator as well and note that considerations are not granted automatically.

- UNSW has strict policies and expectations relating to Occupational Health and Safety (OHS) accessed at http://www.ohs.unsw.edu.au/