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MSc Molecular Biology and Biotechnology

Research Project

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Research Project

Module Name: Advanced Research Project
Module Code: MBB6403
Module Weightage: 60 Credits

Module Aims

This module aims to provide students with the opportunity to complete a research project by extending the laboratory experience as part of MBB6011, and developing new skills in research methods.

This module will improve skills in experimental design and planning, data acquisition and processing, oral and poster presentations, teamwork, and the defence of the dissertation in a viva voce examination.

Research Project

Learning outcomes

By the end of the module, a student will be able to:

1. Demonstrate key research skills, experimental planning and critical analysis / interpretation of experimental data and time management

2. Keep an accurate record of research materials and methods

3. Prepare oral and poster reports based on on-going practical work

4. Work effectively as a member of a laboratory team

5. Prepare a dissertation adequately summarising the laboratory findings, including the important experimental aspects, results and conclusions

6. Defend a dissertation in a viva voce examination

Writing Research Project Report

Research Project During Lockdown – Capstone Projects

We agreed in the beginning that the Capstone Project be continued form home (slightly different form than the usual wet lab projects)

Still writing should constitute what you have learned by doing in the laboratory or working from home and write it in the form of a project report.

The different forms of Capstone Project that our MSc MBB students are doing are briefly described in the next slide.

Writing Research Project Report

The accepted forms of Capstone Projects

Laboratory-based: Lab students come up with a research question, design a study, test their hypothesis using simulations or re-analysis of existing data

Bioinformatics / Big data: Using bioinformatics tools to mine / interrogate (e.g. genomic) datasets. Analysis and interpretation of large publically available (e.g. health, environment) datasets

Computational modelling / Simulations: Investigate existing models or simulations of systems

Grant Proposal: Grant proposal becomes the principle exercisde. Sections within it are those in real grant applications to funding bodies e.g. BBSRC or MRC. "**Pilot**" data comes from previous studies in the supervisor's lab

Critical literature reviews: Hypothesis-driven critical reviews of the literature in areas relevant to the Faculty/School research

Systematic Reviews with / without meta-analysis: a defined, systematic way of undertaking a comprehensive review of the literature

Writing Research Project Report

Writing a Research Report

Blackboard MBB6403 page (MSc MBB students only folder) contain all the required information.

1. Format of Laboratory Project Report
2. General Guidelines for Research Reports
3. General Guidelines for Oral Presentations
4. General Guidelines for Poster Presentations
5. Marking Guidelines for MSc MBB - Research Project
6. Research Project Mark Sheets (Sections A-G)

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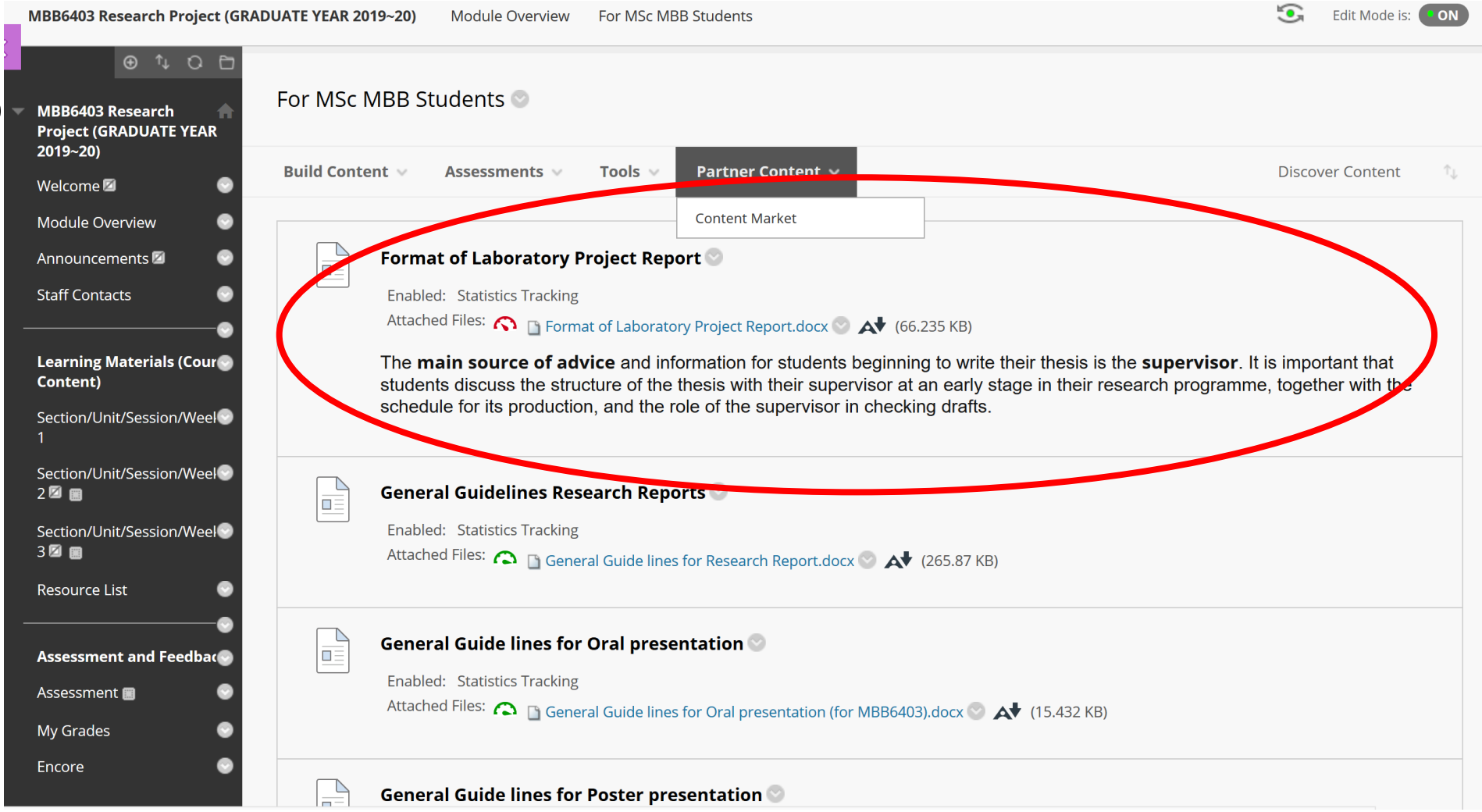
Writing Research Project Report

1. Format of Laboratory Project Report

The **main source of advice** and information for students beginning to write their thesis is the **supervisor**.
It is important that students discuss the structure of the thesis with their supervisor at an early stage in their research programme, together with the schedule for its production, and the role of the supervisor in checking drafts.



Writing Research Project Report

The conventional format:

Usually the project report is divided into Chapters e.g.

1. Introduction
2. Materials and Method
3. Experimental
4. Results and Discussion and
5. Bibliography

Usually the project report also include the following sections

For example

Title page, Summary, Brief Table of Contents and List of Abbreviations followed by chapters of your report as described earlier.

Acknowledgements can be at the end or at the beginning

Appendices are usually at the end

I recommend that start each section on a new page. Numbered sub-sections can be useful, but do not go beyond two levels of sub-sections.

Writing Research Project Report

CHAPTER 1: Introduction:

The research project would need to have an Introduction chapter.
You can summarise here what is known about the topic you are working on.
It should also cover key background information and the studies so far (e.g. related lit review).
That means that you can integrate the relevant parts of the literature review that you have already prepared.
You'd then finish off the introduction by stating the aim and objectives of your research project e.g.

- What were your original plans?
- Why did you want to do?
- What were the benefits of carrying out this project? etc.

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Writing Research Project Report

CHAPTER 2: Materials and Method:
This chapter contain **Methods** and **Techniques** that have been carried out during the project
Try to keep it concise

CHAPTER 3: Experimental (Can be mixed with Results and discussions)
In this chapter you should write about what you have done either before the lock down or at home

CHAPTER 4: Results and Discussion (Can be separate chapters if appropriate)
This result section should contain a narrative account of the experiments performed, divided into sections and subsections as appropriate. Discussion section should contain analysis and interpretation of the results, together with a discussion of how these relate to results obtained by other investigators.

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References

This is a list of all the papers and books that have been cited in the report (including citations in the legends of figures or tables).

Appendices. Although tabulated and calculated results should be included in the Results section, it is occasionally desirable to include raw data in the project report. It may be appropriate to include these data in an appendix, where they will not interfere with the narrative flow of the Results section, but where they will be accessible to the examiners if required. **You should consult your supervisor before including this type of appendix**, since it will often be preferable to condense the data or omit them completely.

Acknowledgements

Research Project Assessment

Module Assessment

The course will be assessed as follows:

1. **Laboratory Conduct** (20%)
2. **Project Report / Dissertation** (8,000 words) (60%)
3. **Viva voce** (10%)
4. **Poster presentation** of research findings (5%)
5. **Oral presentation** of research findings (5%)

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Assessment for the Research Project

Marking sheets are sent to the supervisors along with the **marking guidelines**.
Both documents are available via Blackboard page for you to view.

Section A of marking sheet
Filled by the supervisor
Provide background and context of the project to second marker and also to the external examiner

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Department of Molecular Biology & Biotechnology

Assessment of

MBB6403 Research Project

TITLE OF PROJECT	
NAME OF STUDENT	
SUPERVISOR	
SECOND MARKER	

SECTION A.

(To be completed by the supervisor)

This information will not be used to mark the project but to provide the second marker and the external examiner with an idea of the laboratory context in which the project was conducted.

i. Give a brief outline of the project

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Assessment for the Research Project

Section A (contd.)
Filled by the supervisor

To assess and understand the available resources

Name of student	

ii. Comment on the following points concerning the laboratory project

The technical difficulty

The facilities available

The assistance available from: Supervisor
Technician
Post graduate student(s)
Post-doctoral assistant(s)

The extent and availability of relevant literature, including undergraduate projects

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Assessment for the Research Project

Section B
Evaluation for the laboratory conduct and performance of the student

Evaluated by the supervisor

Carry 20% marks

Name of student	

SECTION B –CONDUCT IN MBB6403 RESEARCH PROJECT

(20% of overall project assessment)

To be completed by the laboratory supervisor, after consultation with members of the research group contributing to project supervision AND the literature review supervisor.

Please grade the performance of the student in the following aspects of laboratory work, using the tick box system and give an overall grade for this section using the 0-100 scale.

	Aspects of Laboratory Work	Distinction 70 - 100	Merit 60 - 69	Pass 50 - 59	Fail 1 -49
1	Manipulative and technical ability, attention to detail use of equipment				
2	Ability to plan and organize practical work within the appropriate time frame				
3	Precision and/or quality of results in relation to what might be expected for this type of project				
4	Ability to keep appropriate records of experiments and results				
5	Independence and originality				
6	Application and Effort				
7	Overall Mark for Conduct				

***Supervisor's signature*.....**

Please write a brief report in the space below, including reference to any marks greater than 80.

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Assessment for the Research Project

Section C for the Project Report

Usually evaluated by the research supervisor

30% marks

Name of student	

SECTION C - ASSESSMENT OF MBB6403 RESEARCH PROJECT REPORT

(To be completed by the supervisor - 30% of overall project assessment)

The supervisor should place a tick in the relevant class for each of the sections 1-9 below, and give an overall mark on the 0-100 scale and initial box 10.

	Aspects of Project Report	Distinction 70 - 100	Merit 60 - 69	Pass 50 - 59	Fail 1 -49
1	Abstract: is it clear, to the point and an accurate reflection of the overall report?				
2	Introduction: is the science covered at an appropriate level with appropriate references? Does it allow a non-expert in the field to understand the aims and strategic approach to the project?				
3	Materials ad Methods: is there a clear description of the methods used in sufficient detail for the experiments to be repeated?				
4	Results (narrative): is there a clear narrative style presenting the results, and has the rationale and design of the experiments been explained?				
5	Results (figures and tables): are the tables and figures clear, with an appropriate layout, properly labelled and have a good legend adjacent to the figure?				
6	Discussion: is there a clear narrative style with a critical analysis of the results (or lack of them)? Have the methods used and their value and limitations been discussed? Are the interpretation of results and conclusions drawn consistent with the data, and is there an explanation how the project relates to other work?				
7	Discussion: is there a summary of the findings and conclusions, and suggestions for future work and/or a suggestion of a better approach to what was done?				
8	References: have the references been cited correctly (as *Cell* but with full journal titles)? Is the reference list complete?				
9	Style and presentation: overall plan, logical structure and ideas clearly presented				
10	Overall Mark (0-100) and initials (supervisor)				

Please write a brief report in the space below. Note that a mark of more than 80 must be fully justified.

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Assessment for the Research Project

Section D for the Project Report

Evaluated by a **second marker** usually another academic in the department

Marking is carried out independently

Second marker do not see first marker's evaluation

30% marks

Name of student	

SECTION D - ASSESSMENT OF MBB403 RESEARCH PROJECT REPORT

(To be completed by the second marker - 30% of overall project assessment)

The second marker should place a tick in the relevant class for each of the sections 1-9 below, and give an overall mark on the 0-100 scale and initial box 10.

	Aspects of Project Report	Distinction 70 - 100	Merit 60 - 69	Pass 50 - 59	Fail 1 -49
1	Abstract: is it clear, to the point and an accurate reflection of the overall report?				
2	Introduction: is the science covered at an appropriate level with appropriate references? Does it allow a non-expert in the field to understand the aims and strategic approach to the project?				
3	Materials ad Methods: is there a clear description of the methods used in sufficient detail for the experiments to be repeated?				
4	Results (narrative): is there a clear narrative style presenting the results, and has the rationale and design of the experiments been explained?				
5	Results (figures and tables): are the tables and figures clear, with an appropriate layout, properly labelled and have a good legend adjacent to the figure?				
6	Discussion: is there a clear narrative style with a critical analysis of the results (or lack of them)? Have the methods used and their value and limitations been discussed? Are the interpretation of results and conclusions drawn consistent with the data, and is there an explanation how the project relates to other work?				
7	Discussion: is there a summary of the findings and conclusions, and suggestions for future work and/or a suggestion of a better approach to what was done?				
8	References: have the references been cited correctly (as *Cell* but with full journal titles)? Is the reference list complete?				
9	Style and presentation: overall plan, logical structure and ideas clearly presented				
10	Overall Mark (0-100) and initials (Second marker)				

Please write a brief report in the space below. Note that a mark of more than 80 must be fully justified.

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Assessment for the Research Project

Section E for the viva voce examination

Evaluated is carried out jointly by Two examiners

One may be supervisor or another academic and one another examiner

10% marks

SECTION E - ASSESSMENT OF MBB6403 *VIVA VOCE* EXAMINATION

(To be completed jointly by both markers - 10% of overall project assessment)

Following the viva voce examination, which should last for 30-60 minutes, please grade the following aspects, using the tick box system and give an overall grade on the 0-100 scale.

	Aspects of *Viva*	Distinction 70 - 100	Merit 60 - 69	Pass 50 - 59	Fail 1 -49
1	**Does the student understand the work done?** For example, why was it of interest; what was the justification for the approach used; is the significance of the results understood?				
2	**Is the student able to think critically about the experimental work?** For example, can the student suggest alternative experiments and predict their possible outcomes?				
3	**Does the student appear knowledgeable about the relevant literature?**				
	Overall Mark (0-100)				

Signature 1.....

Signature 2.....

Please write a brief report in the space below. Note that a mark of more than 80 must be justified

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Assessment for the Research Project

Section F for the Poster presentation

Evaluated by supervisor or any other academic staff member

5% marks

Name of student	

Name of marker	

SECTION F - ASSESSMENT OF MBB6403 POSTER PRESENTATION

(To be completed by the poster marker - 5% of overall project assessment)

Please grade the performance of the student by speaking with them about their research and grade the following aspects of the poster presentation, using the tick box system and give an overall grade on the 0-100 scale.

	Aspects of Poster Presentation	Pass	Merit	Distinction	Fail
1.	**Presentation**: does the finished poster look professional; is the text legible, grammatical and appropriately formatted, and is its meaning clear; are the illustrations of high quality; is the material organised in a way that brings out its significance?				
2.	**Content**: is an appropriate body of material presented; is there an appropriate level of detail and critical analysis?				
3.	**Discussion**: is the student able to discuss the work in a knowledgeable way, and to give appropriate answers to your questions?				
	Overall Mark (0-100)				

Poster marker's signature.....

Please write a brief report in the space below. Note that a mark of more than 80 for must be justified.

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Assessment for the Research Project

Section G for the Oral presentation

Evaluated by supervisor or any other academic

5% marks

Name of student	
Name of marker	

SECTION G - ASSESSMENT OF MBB6403 ORAL PRESENTATION

To be completed by the supervisor / assessor following the oral presentation - each presentation contributes 5% of overall module MBB6403. Please grade the following aspects of the poster presentation, using the tick box system and give an overall grade on the 0-100 scale.

		Pass	Merit	Distinction	Fail
CONTENT:	Coverage				
	Organisation				
VISUAL AIDS:	Appropriateness				
	Quality of preparation				
DELIVERY:	Gestures, eye contact, audibility				
	Timing				
QUESTION HANDLING:	Knowledge of topic				
	Relevance of answers				
Overall Mark (0-100)					

***Oral Presentation marker's signature*.....**

Please write a brief report in the space below. Note that a mark of more than 80 for must be justified.

Question / Answers

Question: Can the deadline for the Project Report submission be extended?

Answer:

a) Few days late submission is acceptable.

b) Extending the date means it will delay the whole process including the evaluation of project reports followed by viva examinations in August. This will then delay the preparing and compilation the results in September. MSc Exam Board meeting is scheduled for the 1st week of October 2020 and missing results means you will not get your degree in January 2021.

c) If there is a genuine need for the extension and supported by the supervisor, it can be considered for individual cases. Managing few delayed results is possible but it is not possible to organise for the whole class. Hence I will not change the final date of submission for the whole class. Please speak with your supervisor as a first step if you have any concerns.

d) I will not question if you submit your report one or two days late.

Question / Answers

Questions: Can you talk specifically about what we need to do in the oral presentation and the poster presentation?

Answer: I plan to request individual supervisors for this activity (5% marks) to conduct the oral presentation in their research group meetings instead of a joint activity this time due to lock down. The marking sheet will be sent to the supervisors. For oral presentation my instructions are same as I gave during last semester as how to prepare and do a good oral presentation.
For poster, this time we are doing poster submission only. You need to submit your poster by the due date and we will arrange marking, either through your supervisors or any other academic in the MBB department. The guideline for poster presentation are available via Blackboard. I will also upload a specimen poster for your perusal.

Please remember that we will also ask you upload your oral presentation in the same shared folder where you will submit your poster.

Question / Answers

Questions: Can you give us more about how to organize tables and figures in the report?

Answer: Although the guidance document suggest that the tables and figures should be on a separate page, I propose to append the pictures / tables between the paragraph where it is quoted and adjust according to the size and arrangements of the table / figure.
Please make sure that the legend of figure / table should be identifiable and in a different format from the normal text of your report.

Question / Answers

Question: Will the presentation be based on the poster or a separate PowerPoint, also what will we need to prepare for the viva?

Answer: Both are different things. The difference in the oral presentation is that you give the introduction orally. Only bullet points are included in the PowerPoint presentation, while in poster you need to introduce the project and summarise in the text. The results diagrams could be the same in both.

For the preparation of viva please see my answer in the recorded presentation at the following link
https://drive.google.com/file/d/1LUIGs7dSpfGs-2EPSKnndqV1EkaN3nmD/view?usp=sharing

Question / Answers

Questions: Can you send us a project report as model？

Answer: It is not possible since there are different models adopted by different supervisors for research projects as described in my presentation.
One model will not fit for all.
Please contact your supervisor for guidance as to how to layout your research report.

Questions: Do I need to make a plan for the experiment at the end of project report ?
Answer: You will write the plan of your project in the introduction chapter not at the end. Usually it is covered and explained in the aims and objective part of the introduction chapter.

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The recorded version of this presentation is also available. Please follow this link as below.

https://drive.google.com/file/d/1LUIGs7dSpfGs-2EPSKnndqV1EkaN3nmD/view?usp=sharing

Thank you