L-Università ta' Malta
Centre for Biomedical Cybernetics

Student Handbook for

Masters by Research Degrees

With the

Centre for Biomedical Cybernetics

Compiled by the

MSc by Research Board of Studies

January 2020

Centre for Biomedical Cybernetics

University of Malta

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Table of Contents

1   Introduction

This Handbook has been prepared to provide you with information that will help you through the M.Sc. by Research in Biomedical Cybernetics. The M.Sc. Programme includes a taught component of 15 ECTS and a research project of 75 ECTS. Since the major component of the Programme is the dissertation, most of the Handbook is concerned with this component. Please dedicate some time to read through carefully.

2   Registering for the taught study units and the research project

The M.Sc. Programme of Study is made up of the following study units:
Research component:

   CBC5000 – Research Project in Biomedical Cybernetics (75 ECTS)

Taught component:

   CBC5001 – Special Topics in Biomedical Cybernetics (10 ECTS)
   ENR5006 – Research Methods for Engineering (5 ECTS)

The research project spans over three semesters (full-time) or six semesters (part-time).

You may be directed to register for other study units instead of CBC5001 as directed by the Board, normally on the advice of the supervisor.

ENR5006 is normally offered in both Semesters 1 and 2. You may register for this study unit in either semester as directed by the Board, normally on the advice of the supervisor.

You may indicate your selected study units by filling in this Google form[1] which will then be processed by the Centre's officer.

3   The Research Project

The research project and dissertation is the major component of the Programme having a credit value of 75 ECTS – this is the equivalent of 1,875 hours of student effort. In view of the major effort required, you should devote a proportionate amount of time.

The Research Project in Biomedical Cybernetics requires you to methodically address an open-ended problem. The aims and objectives are set out together with the project supervisor in the Research Project Proposal prior to the commencement of the project. For the duration of the Programme, the project supervisor will monitor your progress.

The type of work produced, such as, design, experiments, simulation, or analysis, will depend on the project specification and should constitute a defined subset within the area

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[1] https://docs.google.com/forms/d/1EEqZ75pfKGUd_0kaGKkATBYz8u9L3DLErGGwXDjxy0Q/edit

of Biomedical Cybernetics. Towards the end of the year you will submit a written dissertation in English.

4   Choosing a Topic for the research project

Before you apply for this M.Sc. Programme, you should contact the Centre to express your interest in pursuing this Programme and to indicate your motivation and area of interest. The Centre would then consider your expression of interest and, subject to the area falling within the areas of activity of the Centre at the time, and to supervision capacity, would suggest a supervisor with whom you could further develop a research proposal for your application.

Make sure that you choose a topic that is interesting to you since you will be spending a considerable amount of time working on this project.

5   The Research Project proposal

Once you have identified the research questions with the proposed supervisor, you are required to submit a completed M.Sc. by Research Proposal Form Dissertation Proposal Form. You can download a copy of the Dissertation Proposal Form from the CBC website[2].

The dissertation proposal form sets out key aspects of your work:

(a) A brief statement on the proposed research
You should briefly and clearly highlight the problem that the project is attempting to address.

(b) Context, overall goal and objectives
Describe the key works carried out in the proposed area of research and clearly highlight the research gaps that exist. State the overall research goal and specific objectives of the project.

(c) A short statement of methodology
Describe how you intend to carry out this research and which research methods you intend to apply. This methodology will be refined throughout the duration of the project, with the advice of your supervisor.

(d) Project Resources
Indicate the main equipment (hardware/software) and consumables required for the project and availability. Indicate also the required budget and any sources from which funds shall be obtained (e.g. scholarships, research grants etc.). Clarify whether funds have already been secured.

(e) External partners
List any partners external to the Centre, both within and outside the University of Malta.

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[2] https://www.um.edu.mt/cbc/students

(f) Expected Outcomes
List the outcomes you expect to achieve by the end of the programme.

(g) Programme of Work
Provide a time line, clearly showing the major tasks involved and the respective planned duration.

(h) Ethical and Data Protection Issues
It is very important for you to conduct your research in an ethical manner, and equally important that you do not risk your own safety when carrying out research.

It is essential that you read the University of Malta Research Code of Practice[3] and the University of Malta Research Ethics Review Procedures[4] before you start your research and that you abide by them throughout the course of your project.

You must complete the self-assessment checklist for Ethics and Data Protection review which will guide you accordingly on whether your research requires approval from the Ethics Committee[5].

6   Proposal Evaluation Procedure and Allocation of Supervisors

Your proposal form will be considered by the M.Sc. by Research Board of Studies of the programme.

7   Your Supervisor

Your supervisor is normally the same academic member of staff with whom you would have developed the research proposal. Your supervisor will guide you through the various stages of your research project and should be your first point of contact for all matters relating to your research project. You should meet with your supervisor regularly, typically every fortnight for full-time students. Do not miss supervision sessions without good reason. Go to a supervision session well-prepared, with specific issues to discuss and having carried out all agreed work; where the outcome of your work was not as expected, analyse the reasons for this, attempt alternative approaches and develop your ideas for discussion with your supervisor. If you want comments on drafts of your work you should make sure that you give it to your supervisor with enough time to read it before your meeting, and before any deadlines; in the case of the latter, allow enough time for you to make changes.
While the supervisor normally schedules supervision meetings from one session to the next, it is your responsibility to contact your supervisor for meetings and to discuss progress. You should also plan ahead because the supervisor has other responsibilities and cannot be expected to drop everything to react to your requirements instantly.

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[3] https://www.um.edu.mt/__data/assets/pdf_file/0011/338942/ResearchCodeofPractice.pdf
[4] https://www.um.edu.mt/__data/assets/pdf_file/0006/338901/ReserachEthicsReviewProcedures.pdf
[5] https://www.um.edu.mt/urec/onlineforms

However, the supervisor is there to help you. If any difficulty arises, do not be afraid to discuss this openly with your supervisor. If, for any reason, you are unhappy with your supervisor, you are encouraged to first discuss this together but if there are problems that cannot be resolved, you should contact the Course Director, or any member of the Board of Studies.

8   Academic Integrity and Safety Considerations

You must act with academic integrity. You must not plagiarise or falsify data, or make resources unavailable to future researchers. Be sure to take careful notes and use proper citation style to avoid plagiarising sources unintentionally. You must ensure that you keep all your raw data such as acquired biomedical signals, images and data and other relevant material such as consent forms, institutional permissions in a safe and secure place. These must be kept at least until your dissertation has been examined and your mark published. Although it is not usual, examiners have the right to ask for raw data or original source materials should they deem it necessary and you must be able to provide the material requested.

You should always bear in mind your own personal safety while conducting the research. Research in the field can involve risk and personal safety considerations. Therefore, if you intend to carry out research which may pose risks to personal safety, it is imperative that you discuss the matter in advance with your project supervisor. This is to allow you and your supervisor to discuss how you may anticipate, avoid or deal with any possible risks in the proposed research or method of data collection. The supervisor will keep a written record of the discussion.

9   Safe Operating Procedures and After-hours Laboratory Access

If you need to use the laboratories and equipment after working hours you are to ask your supervisor to raise a request to have after-hours access to our laboratories. You will be requested to fill in the 'after-hours' access forms and another form to request an access card to the building where the laboratories are located. You will also be provided with additional safety instructions, a verbal safety briefing by the University's H&S Officer, the Safe Operating Procedures (SOPs) for the equipment that you will be authorised to use, and the Risk Assessment report of the laboratory that you will be using.

10   Plagiarism

10.1   Plagiarism and Collusion

The University of Malta has prepared guidelines on plagiarism and collusion which may accessed from the Registrar's Website.[6]

10.2   Plagiarism Screening Policy for Dissertations and Theses

All dissertations should be checked for plagiarism using the Turnitin service. You may obtain information regarding screening for plagiarism from this document[7] found on the Registrar's Website. Furthermore, additional guidelines[8] are provided to help students to use Turnitin.

11   Progress Reports

You will be required to submit Semester Progress Reports describing the work carried out in the previous semester and the plan for the next semester. You should hand in the progress report to the Centre office by the end of January, end of June and end of September. The template will be provided to you by the Centre Officer by the end of each semester accordingly.

12   IP Policy

Intellectual Property (IP) at the University of Malta is regulated by the University of Malta Intellectual Property Policy (2014)[9]. If you and your supervisor think that your work may have IP that needs to be protected, refer to this policy and contact the University of Malta Corporate Research and Knowledge Transfer Office (KTO) which is the University office responsible for the management and implementation of this policy.

13   Changing the Title of the MSc Dissertation

If a change in the title of the MSc dissertation is required to better represent the work that has been carried out, you should fill in an application form and submit it to the Centre office at least four (4) weeks before the submission of the dissertation for examination[10].

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[6]

https://www.um.edu.mt/__data/assets/pdf_file/0009/95571/University_Guidelines_on_Plagiarism.pdf

[8] https://www.um.edu.mt/__data/assets/pdf_file/0019/329140/plagiarismscreeningpolicydissertations.pdf

[9] https://www.um.edu.mt/knowledgetransfer/intranet/ippolicy2014
[10] https://docs.google.com/forms/d/1CAZCcwZ3GhrUDjIKj98FUQkEFxaaskXDyvEOPFsQAk0/edit

14   Extension of Studies

The deadlines for M.Sc. dissertations are established as per the applicable University regulations for the degree programme. You should find the deadline that applies to you on eSims.

Students are directed to Article 21 of the General Regulations for University Postgraduate Awards 2008 to obtain information on the number and duration of extensions that can be granted to full-time and part-time postgraduate students.

In consultation with your supervisor, may request an extension of studies by filling the relevant request form[11]. You must submit your request form to the Centre at least one month before your official dissertation submission deadline.

15   Dissertation Guidelines

15.1   Dissertation Layout

The dissertation should include the following sections, ordered as listed below:

- Title page (first page, as per *Appendix A*)
- Declaration:

  An Authenticity and Research Ethics form is to be filled in and submitted to the Centre Officer with the dissertation[12].

- Copyright (third page)

The Copyright of this dissertation belongs to the author. The author's rights in respect of this work are as defined by the Copyright Act (Chapter 415) of the Laws of Malta or as modified by any successive legislation. Users may access this full-text thesis/dissertation and can make use of the information contained in accordance with the Copyright Act provided that the author must be properly acknowledged. Further distribution or reproduction in any format is prohibited without the prior permission of the copyright holder.

- Abstract (fourth page)
- Acknowledgements (fifth page)
- Table of Contents
- List of Figures (with the number of the page in which they are located)
- List of Tables (with the number of the page in which they are located)
- List of Abbreviations and Notation (used)

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[11] https://www.um.edu.mt/__data/assets/pdf_file/0009/333864/extensionformPG.pdf

[12] https://www.um.edu.mt/__data/assets/pdf_file/0016/254320/authenticityformpg.pdf

- Glossary of symbols
- Dedication (if any)
- Text (main body of dissertation)
- References
- Bibliography (if any)
- Index (optional)
- Appendix (if any)

15.2   Referencing Style

References

The dissertation must include a numbered list of references and an optional bibliography list. These are to be included just before the Appendices.

References to published work should be listed in the order in which they are mentioned in the text, or in alphabetical order. It is important however that only one system is used in any one dissertation, i.e. whatever system is chosen must then be adhered to.

All references listed must be mentioned in the text. Where material is not mentioned in the text is to be listed, it should appear in a separate section "Bibliography" in alphabetical order of authors' surnames. Care should be taken to ensure that references are accurate and complete with the title of the paper in addition to the source. References should not be given in footnotes. Personal communications should not be included in the list of references but may be mentioned in the text.

The format for references is based upon IEEE standard. This uses a number in square brackets within the text to refer to specific references. For example, "The system was tested by using the Tesla Test [4]. Smith and Brown [3] discuss the variety of errors associated with this test. Other researchers have addressed the same problem using different points of view [1], [5], [10]-[15]."

Mention of a reference in the text should be without initials or titles of the author, thus: "Smith and Brown [3] discuss…."

Extended extracts from printed publications, including previous dissertations, is not allowed, even if referenced.

The IEEE format for the list of references, which typically includes different types of publications, is given in the following examples:

(i) Books
[1] A.B. See, *Engineering Science*, New York, Wiley, 2001, pp. 12-25.

(ii) Reference to a chapter in a book consisting of a collection of contributions by various authors:

[2] D.E. Eff, "The design of artificial machines", in *Discussions on Intelligent Machines*, 3rd ed., vol. 1, T. Eddy, Ed., London, Wiley, 1999, pp. 20-45.

(iii) Dissertation and theses
[3] B.B. Borg. "Design and implementation of a chemical reactor", B.Eng. dissertation, University of Malta, Malta, 1990.

(iv) Papers in journals and periodicals:
[4] P.J. Harris, "On the origins of technology", *ASME Transactions on Mechasystems*, vol. 3, no. 2, pp. 101-108, Jan. 2003.

(v) Articles in published conference proceedings:
[5] I.M. Stern, U.R. Knot and B.S. Goode, "A new method of stress analysis applied to a cantilever structure", in *Proceedings of the 7th International Conference on Structures*, 1995, 123-129.

(vi) On-line electronic sources:
Use internet citations only where absolutely necessary. If a paper has appeared in print (say in a journal) as well as on the Internet, then use details of the printed version for your reference. The reason for this is that on-line references are typically removed or placed at different web addresses in a relatively short time. If your reference source appears as an on-line electronic document only, then it is advisable to include it in a CDROM attached to the dissertation, provided that the copyright regulations for the document permit this. This format for listing on-line references is as follows:

For on-line books or articles:
[6] P. Gale. (2002 April 15). *A History of Electronic Books*. [on-line]. Available: http://www.abc.com
For a web page:
[7] S. Tugali and P. Masade. (1996, May), The robotics web page. [on-line]. Available: http://rob.tu.edu/~robbie.

These guidelines are based on the IEEE web publications [1].

Bibliography
Bibliography and References are two different things.

A Bibliography is a list of books that were read and consulted to obtain general knowledge about the subject matter.

On the other hand, references relate to specific items of information that were found in the literature and used in the preparation of the dissertation. Hence, a whole book cannot normally be a reference; it is more likely to be listed in the bibliography. The reference would be a specific page or number of pages in a book, which contain information relevant to the particular point being made in the student's write-up.

Appendices

The use of an appendix is optional and usually not recommended. However if required the appendix would include material which is supplementary but not key to the understanding of the main text.

15.3   Length of Dissertation

As outlined in the Master of Science in Biomedical Cybernetics bye-laws, the overall length of the dissertation should not exceed 45,000 words, including all text in the body of the dissertation, any text in figure captions or table captions, and any text in footnotes or endnotes.

15.4   Page Format

Text should be printed on A4 white paper using 12 point Times New Roman font or the default Latex font family is Computer Modern. One-and-a-half line spacing should be used with a margin of 40mm to the left, 25mm to the right and at least 20mm for top and bottom. Page numbers are to be printed in the centre of the page footer 10mm from the lower edge of the page.

16   Printing and Submission of Dissertation

Generally, a soft bound copy of the dissertation is to be handed in the Centre Office and one (1) electronic version for library records together with the *Submission of Dissertation/Thesis for Examination*[13]. You should attach the submission form signed by the supervisor which says that the supervisor is aware of the submission. If you submit the form without the consent of the supervisor, you should give a justification in writing why this has not been done. The CD should include the signed Declaration of Authenticity[14]. Dissertation in Electronic Format Guidelines can be found in *Appendix B*. The Electronic version must conform to the standards set by the University of Malta Library (Clause 25 of The General Regulations for University Postgraduate Awards, 2008).

Following examination, two (2) (and an additional one (1) if a co-supervisor was involved in the project) final copies of the dissertation shall be submitted together with a soft copy for library records. These copies should include any amendments recommended by the examiners and shall be bound as follows:
In black cloth with stiff boards and good quality end papers; with lettering in gold colour on the front and spine showing (i) the name of the candidate; (ii) the title or short title of the dissertation; (iii) MSc Biomedical Cybernetics; and (iv) the year of submission. Maps, diagrams, graphs, printed materials, CDs, etc. should be bound with the dissertation, but if this is not possible they should be presented separately in special folders or volumes and numbered. Note that printing of the final hardbound copies should be done on both sides of the paper.

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[13] https://www.um.edu.mt/__data/assets/pdf_file/0010/121105/submissiondissertationorthesis.pdf

[14] https://www.um.edu.mt/__data/assets/pdf_file/0016/254320/authenticityformpg.pdf

17   Open Access

In line with the University of Malta's Institutional Repository Policy, the University Library shall provide open access to the electronic copies of Master dissertations which are awarded a grade A and shall make them publicly available on the University of Malta's Institutional Repository (Clause 58 of The General Regulations for University Postgraduate Awards, 2008)[15].

18   The Marking Process

Once you submit your dissertation for examination and the examiners agree that you may sit for a viva examination, the Centre Office will send you an email to specify the set date for this examination. You are requested to prepare a presentation not more than 30 minutes long and confirm with the Centre office that any required media such as projectors are made available on the day. The dress code for this examination is smart.

The viva examination typically does not take longer than 90 minutes.

The Board of Examiners is also the Award Classification Board. The Board has to calculate the final weighted average mark by weighting each study-unit by its credit value and these are added together for all study-units and divided by the total number of credits.

Final Weighted Average Mark	Classification
80 - 100%	Pass with Distinction
70 - 79%	Pass with Merit
50 – 69%	Pass

19   Assessment Criteria for Dissertation & Oral Examination

The following factors and percentage weightings shall be taken into consideration when assessing the dissertation:

Explanation, contextualization and articulation of research problem and objectives (5%):
- Is the research problem clearly specified and contextualized?
- Are the research questions and hypotheses clearly formulated?
- Does the dissertation capture the relevance, rationale and objectives of the proposed research?

Literature review and relevant background theory (20%):
- Does the dissertation include a comprehensive review and critical discussion of the relevant literature and/or technological developments?
- Is there a description on how the proposed research positions itself within the generic context of works that have been published in the area?

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[15] https://www.um.edu.mt/__data/assets/pdf_file/0013/10831/Postgraduate_Harmonised_Regulations.pdf

- Is the relevant background theory presented, discussed and explained well? Has the theory been contextualized appropriately within the framework of the research problem being investigated?
- Have the latest theoretical developments in the area been presented and described?
- Does the candidate demonstrate a systematic understanding of the relevant background theory and knowledge?

Methodology, design and implementation (30%):
- Is the adopted methodology and/or design approach clearly justified and described?
- Is the implementation well explained?
- Have any novel theoretical contributions from the candidate been rewarded appropriately?
- Is there a clear identification of any limitations, assumptions and constraints which may influence or condition the applied methodology, design approach and implementation?
- Has any novelty in this regard been rewarded appropriately?

Testing, results, analysis and evaluation (25%):
- Are the test procedures sound and objective?
- Do the proposed tests address the research problem being investigated?
- Are the test conditions, assumptions, constraints and limitations clearly identified?
- Are the results clearly presented, analysed objectively and critically evaluated?
- Are the results and analyses discussed objectively? Do they lead to appropriate conclusions and/or fulfilment of the project aims?
- Do the analysis, evaluation and discussion of results exhibit independence of thought? Has any novelty in this regard been rewarded appropriately?

Report structure and organization of dissertation (10%):
- Is the style and structure of the dissertation logical, coherent, flowing and focused?
- Is the candidate's contribution clearly communicated to the reader?
- Does the dissertation conform to the Centre's guidelines?
- Does it make good use of language, citations, figures and tables?

Oral Presentation (10%):
- Is the presentation well prepared?
- Is the candidate clear and confident in his/her delivery?
- Does the candidate's response to the presented questions show that s/he has mastered the research problem well?

The assessment of the dissertation (Descriptors) is given according to the marking and grading table in Article 28 of the General Regulations for University Postgraduate Awards, 2008. [16]

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[16] https://www.um.edu.mt/__data/assets/pdf_file/0013/10831/Postgraduate_Harmonised_Regulations.pdf

20   Possible Outcomes of the Viva Examination

Following the Viva Examination, you will receive an email from the Chairperson with a report with the requested revisions which need to be completed by not later than one month. You will also receive feedback from the two other examiners. Please go through this feedback and update your dissertation accordingly.

Feedback may include minor or major corrections. Senate has published a definition of minor or major corrections for Master Dissertations. [17]

Once done, you are required to send the final updated version of your dissertation, together with a brief report of the main changes, both to the supervisor and to the chairperson. Your supervisor will then confirm these revisions and the secretary will send the relevant documentation for the final mark to be published.

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[17] https://www.um.edu.mt/registrar/secure/procedures/boemasmore60/AppII-Master60crormore-Definitions.pdf

21 Appendices

21.1 Appendix A: Title Page Template

<div align="center">

UNIVERSITY OF MALTA

\<Project title goes here\>

STUDENT NAME AND SURNAME

Supervised by:

SUPERVISOR NAME AND SURNAME (INCL. DR/PROF./ING. AS APPLICABLE)

Co-supervised by:

CO-SUPERVISOR NAME AND SURNAME (INCL. DR/PROF./ING. AS APPLICABLE)

*A dissertation submitted in partial fulfilment of the requirements
for the degree of
Master of Science in Biomedical Cybernetics*

within the

Centre for Biomedical Cybernetics

\<Month spelled out in full\>\<space\>20XX

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21.2   Appendix B: Dissertation in Electronic Format Guidelines

Preparing your dissertation is one of the final steps leading to the award of your degree. The dissertation is a scholarly presentation of the results of the research you conducted throughout the course.

The University of Malta (UoM) requires that you submit a **copy in electronic format** to the University Library. To ensure conformity, certain standards were developed by the University Library. Most importantly, please make sure to:

- include a Table of Contents and bookmarks that link to the respective chapters;
- declaration form is signed;
- submit the dissertation as a single PDF file;
- assign the right code as the filename (to be obtained from Centre office).

Instructions prepared by Library staff are available on the website, or by following these links:

- Instruction booklet[18]
- Video tutorial[19]

The specifications described in the instructions assure uniformity in document to be archived in the University Library, and also ensure the widest possible dissemination of student-authored knowledge.

If you encounter any difficulties in the preparation of your electronic dissertation, you may contact the Library ETD support team on dissertations.lib@um.edu.mt

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[18] https://www.um.edu.mt/__data/assets/pdf_file/0006/404970/ETDnotes20190701.pdf

[19] https://www.youtube.com/watch?v=YR3TIeHBF3E