

**Department of Basic Medical Sciences
Master of Science Biomedical Research
Student Handbook**

ACADEMIC AIMS AND OBJECTIVES

The MSc Biomedical Research programme provides training in several areas of current research in the biomedical sciences with focus on skills needed to facilitate PhD research project development in the specialist areas available in the Department of Basic Medical Sciences. The PhD programmes are not entirely new, but the requirements for completion have been revised to facilitate greater scholastic development. The MSc Biomedical Research offers comprehensive research training to prepare for entry into PhD programmes or other research oriented careers in government, public sector, independent organizations or research centres. The MSc Biomedical Research will operate as a self-financing option; students will pay a tuition that will provide the basic supplies to facilitate the research project completion and possible dissertation proposal generation.

Students from the MSc Biomedical Research programme can qualify for entry the PhD programme through the fourth entry point, which requires the student to be assessed at PhD Transfer Exam. This exam will be guided by the regulations approved by the Board of Graduate Studies. Requirement for consideration for this exam include at least a B+ (60%) performance in all the required courses, successful completion of one year of research work and submission of a PhD project proposal. The interested student must gain the support of the Chief Supervisor.

RATIONALE

The University has embarked upon a strategic transformation process to promote programmes that will attract students with strong interests in research and to strengthen the research output of projects with national and regional significance. To this end, the emphasis is to design programmes that better prepare students to enter PhD degrees through increased taught components that strengthen of the knowledge base and the ability of students to develop an interdisciplinary approach to executing innovative research. The MSc Biomedical Research degree also offers students an entry qualification option for PhD programmes in the other countries, such as United States, United Kingdom, Australia and Canada. It also prepares students for research careers in in

government, public sector, independent organizations or research centres.

Criteria for Admission:

Applicants will apply for registration in the MSc Biomedical Research and declare the discipline of interest offered by the Department (Anatomy, Biochemistry, Applied Microbiology, Molecular Biology, Pharmacology, Pharmacy, Physiology and Toxicology). A transcript and two referee supports will be required. Applicants must hold at least BSc degree, BBMedSc degree in an appropriate discipline at least at the lower second degree. Applications will be reviewed internally and acceptance will be dependent on the identified needs of research supervisors. An interview process may be requested. Accepted applicants will be registered as MSc Biomedical Research and assigned to a Chief Supervisor.

Mode of Delivery:

The courses will be delivered through didactic and online lectures, rotations through research laboratories and mentorship by academic staff.

Academic support:

The Department currently has academic support for the disciplines of Anatomy, Biochemistry, Applied Microbiology, Molecular Biology, Pharmacology, Pharmacy, Physiology and Toxicology. It is anticipated that new disciplines will be added over time.

Library Facilities:

The University of the West Indies Library is already equipped with tools appropriate for the current programmes in existence. This includes access to textbooks and journals both in hardcopy and online (availability anywhere on campus and off campus).

Laboratory Facilities:

The laboratory facilities are already in place supporting the existing system.

COURSE OF STUDY

CURRICULUM

The MSc Biomedical Research programme will only be offered full time. The programme will serve to accelerate students through to the PhD programmes offered in the Department. Students will conduct research with data collection expected to begin during summer semester (year 1) of acceptance. Students will have the opportunity to enter into the PhD programme at 24 months on completion of all the requirements for the MSc with at LEAST a 60% pass and support of the Chief Supervisor. Interested students will complete a PhD Transfer exam conducted under guidelines approved by the Board of Graduate Studies and Research.

MSc Track	Courses	Credi
Semesters 1[yr1]	CORE COURSES	
	BAMS 6011:Understanding Research	0
	BAMS 6012: Laboratory rotation	6
	BAMS 6014:Reading for the Thesis Seminars	0
	Foundation courses in the discipline	0
	Graduate Electives	3*
Semesters 2[yr1]		
	BAMS 6011:Understanding Research	6
	BAMS 6014:Reading for the Thesis Seminars	2
	Foundation courses in the discipline	0
	Graduate writing course	3
	Graduate Electives	3*
Summer [yr1]		
	BAMS 6015:Research by project report	0
	Graduate Electives	4*
Semesters 1-2 [yr2]		
	BAMS 6015:Research by project report	8
	<i>Submission of research report May 1st</i>	
	<i>Oral examination of research report May 25-30th</i>	
	<i>Submission of Corrected Research report June 30th</i>	
TOTAL		35

PhD Entry Track	Courses	Credit
Semesters 1[yr1]	CORE COURSES	
	BAMS 6011:Understanding Research	0
	BAMS 6012: Laboratory rotation	6
	BAMS 6014:Reading for the Thesis Seminars	0
	Foundation courses in the discipline	0
	Graduate Electives	3*
Semesters 2[yr1]		
	BAMS 6011:Understanding Research	6
	BAMS 6014:Reading for the Thesis Seminars	2
	Foundation courses in the discipline	0
	Graduate writing course#	3#
	Graduate Electives	3*
Summer [yr1]		
	BAMS 6015:Research data collection & Reporting	0
	Graduate Electives	4*
TOTAL		27
Semesters 1-2[yr2]	<i>Declare interest in PhD Transfer option with supervisor's support</i>	
	BAMS 6015:Research by project report	0
Summer [yr 2]		
	BAMS 6015:Research by project report	0
	<i>Submit project report with PhD project proposal by June 30th (5 copies)</i>	
Semester 1 [Yr 3]	PhD Transfer Exam in September	
	Approval to Transfer to PhD**	
Yrs 3-5	PhD Research Completion & Thesis Submission	
	Annual Supervisor reports (January 30 & June 30)	
	Graduate seminar & Research presentations (3 minimum project updates)	
	One paper prepared for submission or patent submission	
	Tutorial Assistant training (12 hours)	

** Board of Graduate Studies & Research will review report make the final decision for transfer. Students approved will be register as PhD in the same semester. Students not approved will be awarded the MSc or can

* Six credits of these electives can be approved graduate courses in other departments or, faculties, through guidance from supervisor and approval from graduate coordinator. On-line options are welcomed.

Current writing course available LG600 — Advanced Academic English Language Skills (3 credits).

FOUNDATION COURSEWORK IN THE DISCIPLINE (*no credits*)

Students may be required to complete 6 credits of undergraduate coursework in the discipline to ensure adequate knowledge through approved Departmental courses based on their chosen disciplines. Chief Supervisors must approve undergraduate level courses in the discipline for candidates to register. The student must pass the courses with a **MIMIMUM GRADE** of 60%. This aspect is to be completed by the end of semester 2. Failing students may have one supplemental exam, which **MUST** take place during the summer semester. ***No credits will be awarded for completion of these courses.***

WRITING COURSE (*3 credits*)

Students are required to complete credits to develop their writing skills that will help in completing their research reports and possible translation into published papers.

The current course available to students is LANG6099: Advanced Academic English Language Skills. At the end of the course students should be able to:

- Identify the main uses of writing in their field
- Employ the main features of writing in their field
- Meet the expectations of readers in their field
- Use writing and reading for inquiry learning and thinking
- Integrate their own ideas with those of others
- Use flexible strategies for generating, revising, editing and proofreading
- Critique their own and others' work
- Identify common formats for different kinds of texts
- Practice appropriate documentation of their work
- Control surface features such as syntax, grammar, punctuation and spelling
- Present organized coherent seminars with appropriate technology

BAMS6011 UNDERSTANDING RESEARCH (6 credits)

Duration: 2 semesters [*year 1 semesters 1 & 2*]

Total hours: 36 hours of lectures/12 hours of tutorials/ 120 hours unsupervised work

Eligibility: At least a BSc degree (lower second division)

Rationale:

This course is designed to introduce new graduate students to the main elements of the research process. A goal of the course is to provide students with a variety of perspectives and practice in the conceptualization and design of research, data (statistical) analysis and interpretation, and the application of methodological techniques in the context of research in Basic Medical Sciences. The course will ground the students in concepts such as professional research ethics, reviewing literature, abstract writing and presentation of material. Biochemical calculations and chromatographic separation techniques are also included. The course concludes with the writing of a professional research protocol paper and presenting a formal seminar. The protocol is expected to make a significant contribution to field of study. Students will make an oral defense using approved format of the department during semester 2. Students must present a timeline and budget.

BAMS 6012 LABORATORY ROTATION (6 Credits)

Co-requisites: BAMS6011

Duration: 1 semester [*year 1 semesters 1*]

Total hours: 12 hours of lectures/ 72 hours supervised work/ 96 hours unsupervised work

Eligibility: At least a BSc degree (lower second division)

Course Description:

This course aims to ensure students have adequate mentorship to facilitate the development of their research projects and to promote understanding of what is required to conduct independent research of significant impact. The learning outcomes are focused on the student receiving mentorship from

academic staff of the University to foster an understanding of what is required to develop independent research and thus ensure readiness to pursue PhD research. Students will be required to spend time in the laboratory of the Chief Supervisor and two other mentors. These other mentors must be University staff eligible to supervise research students and likely co-supervisors for the students.

BAMS 6014 READING FOR THE THESIS SEMINARS (2 credits)

Co-Requisites: BAMS6011, BAMS6012

Duration: 2 semesters [year 1 semesters 1 and 2]

Total hours: 48 hours seminar presentation & attendance

Eligibility: At least a BSc degree (lower second division)

Course objective

A seminar series involving presentations from students of weekly journal articles, case reviews and presentation from invited speakers. Each student will be required to use this course to make four oral presentations of current papers in their respective discipline. Attendance at all seminars is compulsory.

BAMS 6015 RESEARCH DATA COLLECTION & REPORTING (8 Credits)

Duration: 1 Year [yr 1 summer semester to yr 2 semester 2]

Total hours: 384 hours of independent study

Eligibility: An approved research project from BAMS6011 and ethical approval (*if required*)

Course description

The aim is to have student work with Chief Supervisor to execute the project approved from BAMS60151. This project must be completed in time to facilitate submission of written report no later than at the end of year 2 semesters 2 (May 30th). Chief Supervisors are expected to ensure the instrumentation and the expertise is in place to ensure timely execution of the research project and work closely with student wishing to join the PhD track to develop a PhD project proposal.

The MSc Biomedical Research is expected to give evidence of comprehensive reading and understanding of the literature relevant and show a clear understanding of the research methods and findings. The research is expected to make at least some independent contribution to knowledge or understanding in the subject area in which the student is working. If the project has the potential to significantly contribute to the body of knowledge, the student can be invited to develop the research for PhD consideration. Students will therefore be given two options of evaluation based on their preferred track. The students should consult with Chief supervisor on which track to enter.

Mode of delivery:

Independent study for at least one year.

Evaluation:

Students have two option of evaluation:

MSc track

- a. A written report of the completed research project report 70%.
Students should be guided by the University Regulations for research report. It should be no less than 8,000 words and no more than 15,000 words (maximum 125 pages, excluding references and appendices). The report will graded by two university examiners
- b. Oral presentation of the project report 30%.
This will be a 15 minutes presentation with an additional 5 minutes for questions.

The course coordinator will set an exam date at which time, students will be expected to make oral presentation and submit written report. The written report will be graded and returned to student for final corrections no later than at the end of June 30th. The student will be given until September 30th of the same year to submit correct research report for award of the MSc degree.

PhD track

- a. A written report graded by two approved examiners 70%.
Students should be guided by the University Regulations for research write-up. It should

be no less than 8,000 words and no more than 15,000 words (maximum 125 pages, excluding references and appendices). The report will be graded by two university examiners.

- b. A written project proposal upgrade 0%
The format of the report will be provided by the course coordinator. Evidence of feasibility must be provided by Chief Supervisor. The proposal must also provide confirmation of at LEAST one co-supervisor.

c) PhD Transfer Exam

This transfer exam has three components.

- Oral presentation of the project report and PhD proposal upgrade 30%.
This will be a 30 minutes presentation with an additional 30 minutes for questions. Students will be graded in the presentation.
- A review of student’s performance in other courses of MSc 0%
- Evaluation of the Assessment Committee 0%

A passing grade of 60% from the written report and oral exam will be required for transfer consideration to be recommended.

PROCEDURE FOR THE PhD TRANSFER EXAM

Students must complete 27 credits no later than semester 1 of year 2 before being allowed to declare interest in the PhD transfer exam. Students must declare their interest to register for the PhD Transfer exam by February 28th for year 2 (semester 2) to the Head of Department through a letter supported by the Chief Supervisor. The review process will follow the procedures outlined in the Graduate Studies and Research Guide for Students and Supervisors handbook (pages 8-9): *(summarized below)*

- 1. The student through the Chief Supervisor and the Head of Departments should write a recommendation letter to the School for Graduate Studies and Research seeking

consideration to facilitate transfer to PhD. The submission MUST include recommendation for composition the Assessment Committee.

- 2. The Assessment Committee will comprise of the Supervisor (s), two independent Assessors and the Chairperson, all chosen from the academic staff of the University.
- 3. This committee should be supported by the Deputy Dean of Graduate Studies and Research in the Faculty of Medical Sciences.
- 4. The Chairperson will request that the student submit at least 5 copies of the written report and PhD project proposal no later than June 30th to the Department office. The Chairperson must also ensure distribution to members of the Assessment Committee.
- 5. The Assessment Committee must complete the review of the document to facilitate oral examination of the Student in September of the same year (academic year 3). The Chairperson will be responsible for setting the date for the oral examination.

The purpose of the PhD Transfer Examination is to assess the overall scholastic preparation of the student and the quality of the proposed PhD project and review and concerns the Assessment Committee identified. It will assess the student’s:

- *ability to apply fundamental concepts of the discipline*
- *capacity for independent thought and creative problem-solving*
- *ability to communicate orally and to respond to questions and comments*
- *academic potential to engage in independent research and complete a quality PhD programme*

The examination has four possible outcomes:

Approve	Transfer to PhD for semester 1 of year 3
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Approve (provisional)	with additional requirements- Recommendation for transfer to PhD after some requirements have been satisfied by January of year 3.
Not approve	Unable to transfer. Award MSc Biomedical Research with grades from written report and oral presentation.
Not approve	Unable to transfer to PhD. Recommend transfer to MPhil Examination in the respective discipline if approved by Chief Supervisor.

The results of the exam will be sent forward with the recommendation of the committee by the Head of Department for their consideration. The final decision will be made by the Board of Graduate Studies and Research.

ELECTIVE GRADUATE COURSES

Students in the MSc Biomedical Research degree must work with the graduate programme coordinator and Chief Supervisor to identify 10 credits of courses appropriate for their chosen course of study. These may include graduate courses in the department (minimum 6 credits) or approved courses from other departments, faculties and universities (local or regional). Laboratory training in external organizations can be assigned credits through BAMS6013. Below is the list of other approved courses from which students can benefit. It is envisioned that course offerings will change over time.

LIST OF SOME OF THE APPROVED GRADUATE CREDIT COURSES

Course Code	Course	Credit
FSCI6302	Population Genetics	3
FSCI6101	Fundamentals of Forensic Sciences	3
PHAL6001	Fundamentals of Pharmacology	2
PHAL6002	Pharmacology by structure and function I	3
PHAL6005	Pharmacology by structure and function II	3
SPSF6005	Sports Physiology (Dept of Medicine)	3
SPSF6006	Sports Science (Dept of Medicine)	3
PUBH 6201	Epidemiology I (Dept of Community Health & Psychiatry)	2
PUBH 6202	Epidemiology II (Dept of Community Health & Psychiatry)	2

Course code: BAMS 6013[ELECTIVE]

Course Title: INTERNSHIP TRAINING FOR BASIC MEDICAL SCIENTISTS

Credits: 3 Credits

Coordinator: PhD Programme Coordinator
(*M Gossell-Williams*)

Pre-requisite: Completion of stage 1 of MSc Biomedical Research-PhD

Total hours: 72 hours of supervised work

Eligibility: Registration in MSc Biomedical Research or any PhD programme of Department of Basic Medical Sciences

Rationale:

The University strategic initiative is focused on encouraging programmes that facilitate greater collaboration with external organizations (academic or non-academic), thus increasing the impact of the University. Students will want to do this course, as it aims to familiarize them with how research is done outside of their own research environment.

Learning Objectives:

The student who successfully completes this course should be able to apply the training obtained to the overall development of their research interests.

Course content and Structure:

The training must be completed externally at another academic institution or non-academic (industrial or government) organization. Normally the activity should support the general area of the student's doctoral research and can be included in the student's dissertation or it can be aimed at practicing the skills gained in the PhD programme or learning skills for future research.

The training may be taken any time after formal admission into the to the PhD programme. It will be the responsibility of the student and research supervisors to make the arrangements. It must provide a minimum of 72 hours (*approximately 2 weeks full time*) of supervised work (*3 credits*). The Chief Supervisor must produce a signed agreement from the selected organization showing what is expected of the student, both work product- and time requirements. Evidence of financial support during the internship must also be presented. On completion, a letter from the organization confirming successful completion of the internship must be presented to the course coordinator.

Teaching approaches:

A total of 72 hours of supervised work outlined in contract agreement.

Assessment Methods:

This course is a pass/fail grade, where pass grade is assigned on presentation of letter confirming successful completion from the participating organization.

APPROVAL TO TRANSFER INTO THE PhD PROGRAMME

Approved students will be accepted into the PhD in the semester 1 of year 3.

Students unable to matriculate will NOT be accepted into the PhD programme, but will be awarded MSc Biomedical Research. The chief supervisor can however recommend that the student's completed research work be considered for MPhil in the respective discipline.

PROGRESS THROUGH AND COMPLETION OF THE PhD PROGRAMME

Students must complete the PhD programme within the next 3 to 5 years full time or 5 to 7 years part time. These years will consist of the following activities.

1. EXPERIMENTATION PERIOD AND SUPERVISION

At the beginning of PhD programme, students must complete and submit the work-plan form to the Department graduate programme coordinator. All benchwork/laboratory must be completed no later than July 31 of year 4 full-time/ year 6 part-time. Supervisors must ensure submission of supervisory report by January 30 and Jun 30 of every academic year to the PhD programme coordinator to meet the University requirement for each semester. It is the responsibility of the Chief Supervisor to indicate progress based on the work-plan submitted. Changes in work-plan must be submitted with supervisor reports. Regulations governing supervisor reports, such as guidance for unsatisfactory reports will follow standard University regulations.

2. GRADUATE SEMINARS & RESEARCH PRESENTATIONS

Graduate seminars will also form part of years 3-5 full time. Students must satisfy the graduate programme requirement that they have attended at least 60% of the approved seminars per academic year. All candidates must complete a minimum three seminar presentations before submission of the thesis for examination. At least two seminars must be at the Departmental level. Oral presentations at scientific conferences may be substituted for one seminar presentation, with adequate evidence that the presentation was done and approval of the Graduate Seminar Coordinator.

3. PUBLICATION/PATENTS

Before approval is given to submit the final corrected thesis for award of the degree, candidate must satisfy one of the following with guidance from the Chief Supervisor:

- at least one paper from the dissertation work prepared in a format ready for submission to a peer reviewed journal.
- Patent submission under consideration.

4. TUTORIAL ASSISTANCE TRAINING

As part of the mentorship experience, the Chief Supervisor is expected to facilitate the student's involvement in tutorials. All students under the supervision of Chief Supervisor (or other senior academic staff member) must provide evidence of conducting at least 12 hours of tutorials before final thesis submission. These tutorials may be to undergraduate or postgraduate level.

AWARD OF THE MSc BIOMEDICAL RESEARCH DEGREE

Completion of the MSc requires submission of the corrected project report no later than the end of September 30 of the same year to the Chief Supervisor who must write to the Course Coordinator to confirm the submission of a satisfactory report.

AWARD OF THE PhD DEGREE

In concordance with University regulation, the PhD thesis must set forth a significant contribution to knowledge or understanding, adding to or critiquing through approved research methodologies. The work will therefore be assessed by appointed examiners who will be guided by these regulations. On successful completion students will be awarded the PhD in the discipline.

WITHDRAWAL

For any reason, should students approved in the PhD Programme be unable to meet the requirements at any time during the PhD programme, students will be required to withdraw from the PhD, but can be awarded the MSc Biomedical Research or submit for MPhil in the discipline on the recommendation of the Chief Supervisor.

Re-admission to the programme after enforced withdrawal

- Candidates, who have had to withdraw from the programme may re-apply for readmission after two (2) year of separation following the guidelines set out by the University.

REGULATIONS AND ASSESSMENT PROCEDURES

All Regulations and Assessment Procedures are guided by those provided in the University of the West Indies Regulations for Graduate Degrees and Diplomas

QUALITY ASSURANCE

The programme will be reviewed by a University internal and external Examiner at the end of a three year period. These reviews will be formal and the generated report inclusive of findings and recommendations will be submitted to the School of Graduate Studies and Research, Dean, Faculty of Medical Sciences and the Programme Coordinator for perusal and implementation of the recommendations. The programme will also be admissible to undergo other quality assurance reviews of the Faculty's programmes organized by the Campus' Quality Assurance Unit.

The programme will fall under the purview of the Office of Graduate Studies and Research and will follow the approved protocol in place to ratify research degrees.

MSc Biomedical Research_PhD Transfer Guidelines Writing for Dissertation and PhD project Proposal

GENERAL INFORMATION

All dissertations must be written in English; quotations, however, may be given in the language in which they were written.

For students terminating in the MSc Biomedical Research, three identical paper copies must be submitted. For students transferring to the PhD, five identical copies must be submitted. The dissertation must be typed on paper of international standard size A4 (210 x 297mm) and soft bound.

Candidates must consult Office of Graduate Studies for guidance formatting, plagiarism and other university regulations.

MSc Biomedical Research project dissertations

Length: Recommend approximately no less than 8,000 to maximum of 15,000 words excluding tables, tables of contents, figure legends, illustrations, references, appendices.

Structure:

- Title Page
- Abstract [should not exceed 300 words]
This must be a short summary of the research presented in the dissertation, including a brief rationale for the study, details of the methods employed, a summary of the results, and an indication of the wider implications of the research.
- Acknowledgement
- Table of Contents
- List of Figures and Tables
- List of abbreviations [use standard recognized abbreviations & SI units]
- Main Text
 - Chapter 1: Introduction
This should set the stage for the study. It should start with stating the research interest. It should give the: Rational for the study (Provide the theoretical and conceptual framework. The theoretical framework describes the aspect selected in which the study is embedded while the conceptual framework describes the aspect selected from the theoretical

framework to become the basis of the study, ie, the justification for the study).

Aims of the study (What exactly do you want to achieve? Why?)

Hypothesis (A testable claim or tentative solution to the research puzzle)

Research questions (questions that will help to prove or falsify the hypothesis. These are the key issues that were investigated during your)

Structure of the dissertation (what will be covered in the following chapters).

- Chapter 2: Review of the Literature

The MSc Biomedical Research requires a basic literature review The literature review should discuss and analyze the body of knowledge with the ultimate goal of determining what is known and is not known about the topic. It summarizes and evaluates the existing knowledge on a particular topic.

- Chapter 3: Methods/data analysis
- Chapter 4: Results
- Chapter 5: Discussion /Conclusions/Limitations/Future work

- References

MSc Biomedical Research PhD TRANSFER report

Length: Recommend approximately no less than 8,000 to maximum of 15,000 words excluding tables, tables of contents, figure legends, illustrations, references, appendices.

Structure:

- Title Page
- Abstract [should not exceed 300 words]
This must be a short summary of the research presented in the dissertation, including a brief rationale for the study, details of the methods employed, a summary of the results, and an indication of the wider implications of the research.
- Acknowledgement
- Table of Contents
- List of Figures and Tables
- List of abbreviations [use standard recognized abbreviations & SI units]
- Main Text
 - Chapter 1: Introduction
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Aims of the study (What exactly do you want to achieve? Why?)
Hypothesis (A testable claim or tentative solution to the research puzzle)
Research questions (questions that will help to prove or falsify the hypothesis. These are the key issues that were investigated during your)
Structure of the dissertation (what will be covered in the following chapters).*
 - Chapter 2: Review of the Literature.

The literature review should discuss and analyze the body of knowledge with the ultimate goal of determining what is known and is not known about the topic. It summarizes and evaluates the existing knowledge on a particular topic.

- Chapter 3: Methods/data analysis
- Chapter 4: Results

- The Proposal Upgrade [**30-32 pages excluding Title page**]

This should set the stage for the PhD study. It should start with stating the research interest. This section must start on a new page. It should give the:

- Title Page: *Proposed PhD Title, Chief supervisor, other co-supervisors if applicable.*
- Abstract (300 words): *This must be a short summary of the aims of the original project the details of the methods employed, a summary of the results and indication of the wider implications of the research. It should then emphasize the rational for the upgrade and outline the objectives.*
- Background to the Upgrade: *This will set the basis for your upgrade request. It should outline the conclusion/ implications from the work completed and include all relevant data (tables, figures) from Chapter 4 to support your upgrade request.*
- Rational for the PhD Upgrade (5 pages maximum): *Provide the justification for the PhD upgrade. This should be supported by any additional literature review not presented in Chapter 2. It is important to outline how the upgrade will support the gaps in the literature*

and therefore add to the body knowledge.

- The aims of the PhD Upgrade, hypothesis and research questions
- Methods and Data analysis (*This should relate only to method specific to the upgrade*)
- Timeline for the upgrade [Gantt Chart]
- Budget required for the upgrade