School of Biological Sciences
MSc / PGDIP

Ecological Management and Conservation Biology
2016/17

Course Handbook

Course coordinator:
Dr Neil Reid
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Ecological Management and Biological Conservation MSc / PGDIP

Educational aims
To prepare graduates in the life sciences and those with other relevant first degrees and/or experience for careers in research, industry and other areas of professional scientific employment. Examples of target employers: environmental consultancies (local, national and international), museums, conservation charities, government (e.g. Northern Ireland Environment Agency, Department of Agriculture and Rural Development, Environmental Protection Agency, Inland Fisheries Ireland, Natural England, Scottish Natural Heritage, JNCC). Many of our graduates move on to PhD research degrees.

Objectives:
The course aims to develop students' generic and scientific research skills, including use of bibliographic resources, communication and the role of statistics in a research programme. Students will develop an understanding of appropriate subject-specific material concerning the four most significant threats to biodiversity worldwide: habitat destruction; introduced species; overexploitation; and climate change. Topics include conservation genetics, invasion biology, resource exploitation, and climate change biology. Skills learned include Geographical Information Systems (GIS) and statistical programming and inference using R. Students on the MSc programme will refine their research skills and knowledge of a specific area through a research project.

Learning outcomes
On completion of this course students should be able to:

- deal with complex environmental issues systematically and creatively
- communicate their conclusions clearly to specialist and non-specialist audiences
- demonstrate personal initiative, independent and team-orientated skills in tackling and solving problems
- demonstrate the independent learning ability required for continuing professional development

These generic outcomes will be accompanied by subject-specific knowledge in species identification and the science underlying conservation biology. This involves the evaluation and analysis of the effects of anthropogenic processes on natural populations and ecosystems.

Teaching and related staff:
- Dr Neil Reid (NR) - Coordinator   neil.reid@qub.ac.uk
- Dr Paul Williams (PW)   p.williams@qub.ac.uk
- Dr Jude Stephens (JS)   j.stephens@qub.ac.uk
- Prof Ian Montgomery (WIM)   i.montgomery@qub.ac.uk
- Dr Keith Farnsworth (KF)   k.farnsworth@qub.ac.uk
- Dr Jon Houghton (JH)   j.houghton@qub.ac.uk
- Prof Jaimie Dick (JD)   j.dick@qub.ac.uk
- Dr Sarah Helyar   s.helyar@qub.ac.uk
- Dr Tancredi Caruso (TC)   t.caruso@qub.ac.uk
- Prof Mark Emmerson (ME)   m.emmerson@qub.ac.uk
- Gillian Riddell (GR)   g.riddell@qub.ac.uk

Programme structure (for students registered in 2015/16):
The course consists of five modules that are taken by all students:
1. Ecological Management and Conservation Biology (BBC8034)   40 CATS
2. Foundations for Research in the Biosciences (BBC8042)   20 CATS
3. Skills in Ecological Management (BBC8035)   20 CATS*
4. Professional Development (BBC8026)   20 CATS*
5. Literature review (BBC8025)   20 CATS

The following module is for the MSc pathway only:
6. Research project (BBC8001)   60 CATS
   TOTAL   **180 CATS**

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* **Please note**: The Module Specifications for BBC8035 and BBC8026 were changed between 2015/16 and 2016/17 to reflect both the perceived and real disparity in the volume and technical difficulty of the work involved. BBC8035 has substantially more Continuous Assessment and the learning outcomes are more skills based than BBC8026. Indeed, BBC8035 been judged to contain approximately three times the work of BBC8026). The redistribution of CATS points was to correct the disparity in allocated CATS points but does <u>NOT</u> reflect any change in either the volume or difficulty of work involved in either module. For students whose administration has been affected, this change has no absolute or relative impact on the volume or difficulty of the work required to achieve the 180 CATS required overall for the MSc. We apologise for any administrative confusion.

ASSESSMENT OVERVIEW - each module has an assessed component:

Ecological Management & Conservation Biology BBC8034 (coordinator Dr Neil Reid):
50% continuous assessment
      (1)   Poster session on Invasion Biology [10%]
      (2)   Seminars (PowerPoint presentations) on Conservation Genetics [10%]
      (3)   Group Seminars on Environmental Impact Assessment [10%] Postponed to Feb '17
      (4)   Field trip notebook written reports on Ecological Management [20%]
50% exam
      (5)   The exam consists of essay questions [17/01/2017]

Foundations for Research in the Biosciences BBC8042 (coordinator: Dr Paul Williams)
100% continuous assessment
      (1)   Research seminar critique [20%]
      (2)   Research grant proposal [60%]
      (3)   Poster presentation [20%]

Professional Development BBC8026 (coordinator: Dr Judith Stephens)
100% continuous assessment
      (1)   Learning journal [50%]
      (2)   Written report [50%]

Skills in Ecological Management BBC8035 (coordinator: Dr Neil Reid)
50% continuous assessment
      (1)   Geographical Information Systems assignments (20%)
      (2)   R statistics assignment(s) (20%)
      (3)   Research Project presentations (10%)
50% quiz (08/03/2017)
      (4)   Multiple response quiz (using Question***mark***)

Literature review BBC8025 (coordinator Dr Neil Reid):
100% continuous assessment
      (1)   Written report [submitted early 2017]

Research project BBC8001 (coordinator Dr Neil Reid):
100% continuous assessment
      (1)   Research Project [25%]
      (2)   MSc thesis [75%] submitted 31st August 2017

Study regulations
Award and pathway regulations: (Supplementary to the general University and specific Faculty Regulations)

Diploma: The programme is taken full time in a year or part-time in two years. To be awarded a Diploma, candidates must obtain a mark of at least 50% in BBC8034, and have an average mark in the four modules of 50% or higher, with no more than one individual module mark below 50%. A candidate with at least 50% in Ecological Management and Conservation Biology plus an average of 50% in the other modules will be permitted to transfer to the MSc - the regulations governing the MSc in Ecological Management and Conservation Biology will then apply. This will involve completing a research project / MSc dissertation (BBC8001).

MSc: The programme is taken full time in one year or part time in two years. To be awarded an MSc, candidates must obtain a mark of 50% or more in BBC8034 and BBC8001, and have an average mark in the 6 modules of 50%, with no more than one individual module mark below 50%. Candidates who obtain an overall average mark of 70% or more, 70% or more in the research project and an average of 65% or more in the other modules will be awarded an MSc 'with Distinction'. Candidates who obtain an overall average mark of 60% or more will be awarded an MSc 'with Commendation'. A candidate who fails to satisfy the Board of Examiners for the award of an MSc may, provided a satisfactory standard has been achieved (and on the recommendation of the Board of Examiners), be transferred to the Postgraduate Diploma; the regulations governing the Postgraduate Diploma in Ecological Management and Conservation Biology will then apply.

Calculation of marks
The final pathway mark is based on a weighted average of the modules taken. Weights follow the 'CATS' points tariffs below.

CATS points for students registered in 2016/17
   1. Ecological Management and Conservation Biology (BBC8034)   40
   2. Foundations for Research in the Biosciences (BBC8042)   20
   3. Literature review (BBC8025)   20
   4. Skills in Ecological Management (BBC8035)   30*
   4. Professional Development (BBC8026)   10*
   5. Research project (MSc pathway only, BBC8001)   60

The CATS are converted to a percentage mark and the Degree/Diploma awarded on that basis.

* Please note: Students registered as part-time in 2015/16 and completing their degree in 2016/17 will be assessed with BBC8035 equal to 20 CATS and BBC8026 equal to 20 CATS (see full explanation for any disparity is given on page 3 above).

Regulation 2.6 M level Postgraduate Awards states:
For Diploma results there shall be a common mark scale as follows:

   70+   Pass with distinction
   60+   Pass with commendation
   50+   Pass
   Below 50   Fail

For Master's Degree results there shall be a common mark scale as follows:

   70+   Pass with distinction
   60+   Pass with commendation
   50+   Pass
   Below 50   Fail

Students must pass all modules of an M level taught postgraduate programme before an award can be made. Given that all modules must be successfully completed, students will be permitted to retake failed taught postgraduate modules on one further occasion.

Study regulations
More detail is available from the School Office, the University Quality handbook and the Programme Specification. This handbook is intended as an outline guide to the course.

Plagiarism
The usual School of Biological Sciences rules apply over plagiarism. Credit cannot be given for work that is not the student's own (and disciplinary procedures exist for sanctioning plagiarists). Work that is "not the student's own" includes 'cut and paste' compositions from the web, unattributed quotes or opinions and identical passages of writing appearing in submissions from separate students.

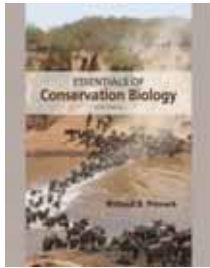If in any doubt please check with lecturing staff or the School documentation.

Policy on late submission of coursework
It is University policy that students be penalized for the late submission of assessed coursework (i.e. anything which counts towards a final module mark). The penalty system takes the form of a 5% deduction from the total available marks for each working day that the assignment is late, up to a maximum of 5 working days after which a mark of zero will be awarded. Where the assessed work element accounts for a certain proportion of the module mark, the 5% penalty will apply to the assessed element mark only and not to the overall module mark.

Exemptions from the penalty will only be granted in extenuating circumstances and if the student has made a case in writing to the member(s) of staff designated by the School within three days of the deadline for submission. The University has issued guidelines on the kinds of extenuating circumstances which are normally considered acceptable or unacceptable. Students seeking exemption from the penalty on the grounds of extenuating circumstances must do so in writing, using the standard application form. The form must be submitted to the designated member of staff in the school within three days of the deadline for submitting the assessed coursework concerned.

Unless stated otherwise, students should submit **electronic copies** of any work for assessment via **Turnitin**.

Core textbook:

Primack, Richard B. 2014. Essentials of Conservation Biology. 6th edition. Sinauer. ISBN: 9781605352893 from £46 from Amazon

Recommended reading:

- Van Dyke, F. 2008 Conservation biology: foundations, concepts, applications. 2nd Edition. [Springer hard copy £44; e-book £35] http://www.springer.com/life+sciences/ecology/book/978-1-4020-6890-4

- Gaston, KJ & Spicer 2004 Biodiversity: An introduction. 2nd Edition. http://eu.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002679.html [Wiley hard copy 29.95; e-book £23.99]

- Hunter, ML & Gibbs JP 2007 Fundamentals of conservation biology (3rd Edition). http://eu.wiley.com/WileyCDA/WileyTitle/productCd-1444308971.html
- [Wiley hard copy £39.99; e-book £24.99]

- Caughley G. & Gunn A. 1996 Conservation biology in theory and practice. Wiley [plenty of copies available second hand e.g. Abe Books [http://www.abebooks.co.uk/]

- Meffe, G. K. & Carroll, C. R. 1997 Principles of conservation biology. Miller, L. 2001 Careers for nature lovers & other outdoor types.

- Sutherland, WJ 1996 Ecological census techniques: a handbook Sutherland, WJ 1998 Conservation science and action.
- Sutherland, WJ 2000 The conservation handbook: research, management and policy.

Although these books are available in the library, students should consider purchasing the main general text to cover the course (Primack 2014) Particularly relevant electronic journals, available through Science Direct and the University library web pages, are:

(1)   Journal of Applied Ecology
(2)   Conservation Biology,
(3)   Biological Conservation,
(4)   Environmental Conservation,
(5)   Trends in Ecology and Evolution
(6)   Conservation Evidence

See also the Millennium Ecosystem Assessment at:
http://www.millenniumassessment.org/en/index.aspx

Other mainstream journals contain material of interest,
e.g. *Nature, Science, Advances in Marine Biology, Ecological Applications, Journal of Animal Ecology, Functional Ecology, Journal of Ecology*. Web resources include NGOs, the world conservation monitoring centre, government conservation bodies, the EU, museums and university web pages. Job information: http://www.environmentjob.co.uk/jobs

Ecological Management and Conservation Biology module (BBC8034)

Module Coordinator: Dr Neil Reid neil.reid@qub.ac.uk MBC room 05.014

Objectives
As the main module for the MSc and Diploma pathways, this module's objectives reflect the subject-specific aims of the programme: an introduction to, and review of, subject-specific material concerning the four most significant threats to biodiversity worldwide: habitat destruction; invasive species; overexploitation; climate change.

Material covered is diverse and includes conservation genetics, invasion biology, resource exploitation/harvesting, and climate/environmental change biology in different ecosystems. The module content is designed to provide a framework for applying critical thinking to solve conservation-related issues in a variety of different subject- based and work-based contexts.

Learning outcomes
The learning outcomes reflect the overall outcomes of the MSc and Diploma pathways. Students should be able to demonstrate knowledge of a number of areas underpinning conservation biology including: biodiversity assessment, effects of management of habitats, the principles of conservation genetics, decision support systems (uses of modelling), environmental economics, and conservation impacts of introduced species.

Core teaching hours information
In Semester 1, the core teaching hours will normally be on Monday and Tuesday (though ad hoc lectures maybe added throughout the year depending on need). The rest of the week is available for independent self-directed study/group work. Students who would like to attend undergraduate lectures are very welcome. If attending more than one or two it would be helpful to notify the course coordinator for those lectures.

  MBC = Medical Biology Centre
  WMB = Whitla Medical Building

The WMB is next to the MBC – from the MBC main entrance, keep going straight through the coffee area and out the doors at the back; the WMB is 50m along the path. See building number 23 on the map here: http://www.qub.ac.uk/home/TheUniversity/Filestore/Filetoupload,471370,en.pdf

There will not necessarily be the same teaching hours or at the same location every Monday or Tuesday: consult updated timetables provided by Dr Neil Reid by e-mail for details. *****IT IS VERY IMPORTANT YOU CHECK YOUR QUB E-MAIL DAILY THROUGHOUT THE TERM***** This will be our primary means of communication with students.

School Seminars & *ad hoc* lectures
The School of Biological Sciences runs a weekly seminars series scheduled for Monday lunchtime (1-2pm) and all PGDIP/MSc students should attended even if not directly relevant. Some seminars in other departments including Geography are also very interesting. Attendance at these seminars will form the basis for completing the seminar proforma exercise for BBC8042.

Skills in Ecological Management Module (BBC8035)

Module Coordinator: Dr Neil Reid

Objectives

As one of the specialist modules for the MSc and Diploma pathways, this module objectives reflect the subject-specific aims of the programme: the acquisition of more advanced skills.

Learning outcomes

The learning outcomes are the skill-related outcomes of the MSc and Diploma pathways, including experimental design, modern statistical (R) programming software and Geographical Information Systems (GIS).

Core teaching hours information

This will be taught wholly in Semester 2. Most of the contact hours will be scheduled for Monday, Tuesday and Wednesday, in various venues depending on the nature of the class (e.g. computer practicals will be held in computer labs).

Location

Mainly computer labs in the MBC: consult timetable provided by Dr Reid for details.

Course components

R for Ecologists. R is now the main way in which data are handled and analysed in ecological research and across much of science in general. We will begin with the basics of what the R is and what it does, how to read and manipulate data files and how to display data and perform basic statistical tests given, the theory behind test selection.

Introduction to Geographical Information Systems (GIS). Students will be introduced to the main features of ArcMap and given the opportunity to manipulate spatial data and produce maps of ecological habitats and species distributions. The course will then move on to showing how large spatial datasets can be accessed and manipulated; finally, students will be introduced to species distribution modelling (SDM) and will analyse large-scale species distribution patterns as a function of environmental variables and produce maps showing their results.

Science communication. Students will be expected to present a PowerPoint presentation on their BBC8001 Research Project outlining the background in the subject area, the specific research questions, hypoteses and a sketch of the methods most likely to be used. Students will be expected to attend ALL presentations (not just their own); as participation i.e. asking questions will be assessed.

Assignment: Continuous assessment: 1) GIS assignments, 2) R stats assignments, 3) Research Project Presentations*, 4) Multiple response quiz (online using Question*mark*)*

* Please note: The 2015/16 Continuous Assessment on creating Species ID Guides has been replaced with Research Project Presentations whilst the Species ID exam has been replaced with a multiple response quiz on both GIS and statistics during 2016/17. Great emphasise is now placed on transferable skills aimed at improving employability rather than rote-learning recall. Species ID skills are taxa specific and not transferable between geographic regions. Science Communication, GIS and an understanding of statistics are key learning outcomes of this module and have, therefore, succeeded the Species ID elements. Any resources on Species ID, GIS or Statistics from 2015/16 have been replaced with updated resources in 2016/17. Otherwise, the *volume* and *difficulty* of work (and the percentage breakdown of the Continuous Assessment) contained in this module remains the same.

Foundations for Research in the Biosciences module (BBC8042)

Module Coordinator: Dr Paul Williams p.williams@qub.ac.uk

Aims
The aim of this module is to introduce you to the process of designing and planning a research project including all associated aspects, such as formulating hypotheses, designing experiments, budgeting, analysing data, considering ethical implications of the research and understanding the potential impact of the research.

Learning Outcomes
Students completing this module should (i) understand the diversity of sources from which research is funded (ii) understand how use the scientific method to formulate hypotheses to test scientific questions (iii) understand how to use statistical procedures to analyse data (iv) understand how to write a scientific proposal to attract research funding understand how to recognise and deal with ethical implications of their research (vi) understand how to recognise the impact of their research.

Module Staff
- Dr Christoph Engl (CE)   c.engl@qub.ac.uk (**co-coordinator**)
- Dr Paul Williams (PW)   p.williams@qub.ac.uk (**co-ordinator**)
- Dr Cuong Cao (CC)   c.cao@qub.ac.uk
- Dr Edel Hyland (EH)   e.hyland@qub.ac.uk
- Dr Gareth Arnott (GAN)   g.arnott@qub.ac.uk
- Dr Hansjoerg Kunc (HK)   h.kunc@qub.ac.uk
- Dr Katrina Campbell (KC)   katrina.campbell@qub.ac.uk
- Dr Konstantin Panov (KP)   k.panov@qub.ac.uk
- Dr Mark Mooney (MM)   m.mooney@qub.ac.uk
- Dr Neil Reid (NR)   neil.reid@qub.ac.uk
- Dr Nikki Marks (NM)   n.marks@qub.ac.uk
- Mr James Dillion (JD_IM)   re@qub.ac.uk
- Mrs Joanne Graham (JG)   j.graham@qub.ac.uk
- Professor Gordon Allen (GA)   ap.allan@btinternet.com
- Professor Jaimie Dick (JD)   j.dick@qub.ac.uk

Assignments
Summary of BBC8042 assessed component (details given in relevant lectures):

1. Research seminar critique (20% of final mark).
2. Research grant proposal (60% of final mark).
3. Poster presentation (20% of final mark).

The module final mark will be comprised of the above three continuous assessment exercises. All written assignments should be word processed and submitted online through the assignment section of the module homepage. You do not need to submit the poster, this will be assessed in the poster presentation session (see BBC8042 Handbook).

Literature review (BBC8025)

Literature review to be prepared and submitted (2 copies) to School Office. Students must also submit their literature review to the plagiarism - checking service Turnitin.

Instructions for using Turnitin: http://www.turnitinuk.com/en_gb/home
Class ID 622058 **[this WILL change – you will receive this by e-mail]**
Enrolment password: conservation

Objectives
To allow students to research a topic in depth, evaluating a variety of information sources to produce a critical review.

Learning outcomes
Subject-specific knowledge
Practice of research and independent learning skills Practice of scientific communication skills
Experience in presenting information to a non-specialist audience

Principle
The central role of the literature review is to read and review literature that is relevant to your project but is much broader in scope. For example, if your project is on the invasion of an Irish river by an alien bivalve, your literature review should cover invasive species more generally, or aquatic invasions, or control of invasive species (or similar broad topic).

Title
Draft title to be chosen with project supervisor, in consultation with Module Coordinator, by week 12, first semester. It is expected that the literature review title will be agreed with your project supervisor, and that the supervisor should be able to read at least one draft. If anyone has difficulty getting a project sorted out, complete with supervisor, please consult with the Module Coordinator.

The review
How you set about the literature review will depend on your topic and your personal approach. The number of papers that you will read varies a lot depending on the topic but you should expect to read at least 20 papers in depth and dip into others. The literature should be selected from the Web of Knowledge, using relevant search terms. Your supervisor may also supply some papers. The review will have a title, will normally have an introduction, various topic headings with text on those topics, and a final conclusion about the subject of the review.

Format: A4 paper 2 cm margin, 12 point font. 5,000 word guideline max. (excluding references), but this is not absolute.

Abstract: A one-page (max.) non-technical abstract should be supplied that would be comprehensible to an educated 14-year old (as for grant applications to Natural Environment Research Council).

Marking: The mark sheet is provided so you can see the marking criteria. Note that you get credit for relevant figures and tables. Using Turnitin plagiarism detection software you can ensure that you have not accidentally copied material; this is important.

Late submissions: Reviews may only be submitted late with permission of the Course Coordinator; requests to allow late submission must be made to the Coordinator well in advance of the deadline and in writing. Such requests should propose an alternative deadline. Reviews that are submitted late without consultation with the Coordinator may lose 5% from the total available marks for each working day that the assignment is late, up to a maximum of 5 working days after which a mark of zero will be awarded; this could result in failure of the course.

How to approach the literature review

The literature review has several benefits. It allows students to teach themselves about material relevant to the course and potential careers. This ability to self-teach is essential in most jobs and forms one of the learning outcomes for the course ('independent learning ability required for continuing professional development'). Preparing thoughtful reviews requires more than acceptance of the stated facts and involves critical evaluation of data.

Students should aim to discuss the scope of the review in meetings with their chosen supervisor. Ideally, supervisors can review drafts. The usual standard is that work can be looked at once; to supply feedback on style, content and structure. If you wish to have drafts looked at by your supervisor you should check that they are able to do this (present during January) and material should be handed to them at least 8 days before the deadline.

Scientific communication is a skill that can be improved. Most people can improve the quality of their written work by careful attention to grammar and style. This involves specific points such as avoiding over-long sentences and/or large numbers of prepositions.

Other elements of good style include a clear structure and the use of topic sentences to introduce each paragraph. The review should be more than a list of different studies (this was done, then this was done etc.). Ideas on style are covered by a variety of books and web resources including:

How to Write About Biology: The Essential Guide for Students by J. Pechenik, B. Lamb (second-hand copies are usually available online for c. £3).

Some issues were common in work previously produced on this course. These are relatively straightforward to address.

Page numbering is essential!

Paragraph structure is critical – it is very difficult to read work if paragraphs are not separated by indented first lines (preferred) or blank lines.

Do include tables and figures – see marking scheme

Species names:
- Spell species names correctly!
- Always put species' scientific ('Latin') names in italics
- Capitalize genus only (e.g. Semibalanus balanoides)
- In some types of report, you should give the authority as well: e.g., Semibalanus balanoides (L.). Ask if you do not know what an authority is.

Citation of references

Scientific journals often have general instructions on style and content on their web pages (look under guide to authors). You should format your reference citations in the style of a stated journal (e.g. Biological Conservation, Journal of Animal Ecology).

- All references referred to in the text should be in the references section. This is a key part of any 'literature review' so check carefully that the reference section is complete. [This is the easiest way to annoy an academic!]
- Give dates for references in text (e.g., Johnson & Montgomery 1892)
- Be consistent over the use of '&' and 'et al.' (et al. is for cases of three or more authors; two authors are given as Johnson & Montgomery 1892 or Johnson and Montgomery 1892)

Typographical errors
- Review text carefully to avoid these. Use spell checkers but watch out for rogue apostraphe's!!

Evaluate literature

- Add value to the literature you review. Your job as a reviewer is to go beyond a list of what others have done ('A measured temperature, B measured salinity...'). You should compare different studies. Why might the results differ (if they do), what gaps exist in what is known? (rather than just saying 'more needs to be done').

Evaluate conclusions from the literature. Are they generally applicable and soundly based or dependant on particular conditions or assumptions?

MSc Literature review (BBC8025)

Student name..   **Marker 1**   **Marker 2**

Marking scheme (grade each by descriptors, from poor to exemplary)

	Poor (<40)	Exemplary (>70)

A. Non-technical abstract

Appropriate style and content   _____   _____   _____   _____   _____
     Too technical/poorly written   easy to read and follow

B. Content

Appropriate sources used   _____   _____   _____   _____   _____
     few sources or sources of questionable reliability   excellent use of original material

Evidence of scholarship   _____   _____   _____   _____
     points not supported by evidence or arguments   good support for points

Appropriate depth   _____   _____   _____   _____   _____
     Superficial treatments   clearly postgraduate level

Appropriate breadth   _____   _____   _____   _____   _____
     too narrow for proper understanding   broad enough to cover the issues

Clear development of ideas   _____   _____   _____   _____   _____
     Vague, difficult to follow   clear points, well made

Critical analysis   _____   _____   _____   _____   _____
     Simple catalogue of facts   comparisons made, issues raised

C. Style

Correct citation| _____   _____   _____   _____   _____
     missing references, details; inconsistent citation   clear, consistent, complete

Clear organisation   _____   _____   _____   _____   _____
     hard to follow, poor paragraph structure   easy to read, clear direction

Effective use of figures and tables   _____   _____   _____   _____   _____
     few/no figures/tables;   used as 'window dressing'   used to support and expand points

Correct use of language   _____   _____   _____   _____   _____
spelling/grammar errors so understanding is impaired   flawless sp./grammar; easy to read

General comments

+-------------------------------+
| **Overall mark** .... |
+-------------------------------+

Level descriptors and scale:

>85   **near-perfect**; "as good as the assessor could have done"

70-85   **excellent**; "impressive and worth copying to keep for reference"

60-69   **comprehensive** to **very good**; "creditable effort with minor difficulties"

50-59   **adequate** to **satisfactory**; "the right idea, but some significant problems"

40-49   **deficient** to **incomplete**; "shows a lack of understanding of what is expected"

<40   **abysmal** to **weak**; "unacceptable from a postgraduate student"

Professional Development module (BBC8026)
Coordinator Dr Judith Stephens, j.stephens@qub.ac.uk

Learning outcomes: awareness of the professional standards and requirements in the biosciences. Students will have improved reflective skills and should be able to demonstrate an evaluation of the use of knowledge, or the application of techniques, in an applied context. This awareness of professional standards will be through working with or shadowing professionals in the field or through an assignment. The module is individual-based for assessment – involving a learning journal and a final report. Time commitment for the student might be of the order of 4-6 days 'in the field'. The work will be more vocational than research based. For example: produce a report for Ulster Wildlife trust on recruitment issues for staff/volunteers or refine a 'Science Shop' proposal into a clearer project or set of options (could act as basis for project later). Placements are to be developed in Semester 1, then carried out in Early 2017.

Assessment
There are two assessed elements of the Professional Development module in Ecological Management and Conservation Biology.
1.   A report [50%]
2.   A learning Journal [50%]

Two copies submitted through the School Office. This deadline serves to separate the research project (BBC8001) from Professional Development. By agreement, the professional development deadline can be changed, e.g. the need to do early fieldwork in a project. The written elements each represent 50% of the module mark.

Report: Is a straightforward description of how you arranged the placement (e.g. any difficulties and negotiations involved), who it was with (include a description of the organization) and what was carried out during the placement. This is to include a description of dates, how long it took, why the task was of benefit to the sponsor and any main conclusions. This report may be about 3-4 A4 sides in length. **Marks** will be awarded for clarity. Extensive background research is not required – this is covered elsewhere in the course (project and literature review). Also note the task itself is not being assessed, it is how students explain and provide a context for what they did that is of interest.

Learning Journal
What is it? A learning journal is a record of personal reflection and learning on the activities in the placement. Going on a placement will involve a number of new situations to deal with and new experiences. The journal is therefore a record of what the anticipated experiences were and how the actual placement worked out. Important questions might include: how is the experience different from what I anticipated would be the role of a park ranger/consultant? From an educational standpoint, learning journals are thought to be useful in that they make a student a more active learner as the act of writing a journal achieves more than reading what someone else has to say on the subject. Unlike in most written work, there is less scope for a right or wrong answer. Successful and enjoyable working practices involve participants being able to reflect on what works and what doesn't and the ability to suggest ways of dealing with new situations. Writing a learning journal is a formal way of practicing these skills.

How will it be assessed? Format and style are up to each student. As a minimum there should be three elements: a before, during and after reflection on the placement. 3-4 sides A4 should be sufficient to cover your analysis.

Grade point descriptors— learning journal

Mark 80–100 (%)
- An outstanding learning journal, excellent in every respect: showing extensive knowledge and understanding and an outstanding ability to analyze, synthesize and evaluate
- well presented in a very well-organized manner
- exhibits a high level of insight, marked originality

70–79 An excellent learning journal in most respects:
- evidence of extensive knowledge and understanding and very good high-level cognitive skills
- well organized, sharply focused and well balanced
- contains good insights and possibly originality
- very good ability to analyse, synthesize and evaluate the relevant material

60–69 A good learning journal: well argued
- covers relevant points in satisfactory depth well-structured arguments
- somewhat descriptive

50–59 An adequate learning journal: may lack clarity
- has little to say about the challenges of the placement weak use of examples
- possibly weak organization too

40–49 A weak learning journal: lacks clarity
- poor use of examples and poor organization
- may lack focus, be poorly written, short or incomplete shows very little evidence of reflection

Fail
- poorly organized and presented no evidence of reflection

Research Project (BBC8001)
*** MSc only ***

Objectives
For students to research a topic in depth, working independently (but seeking appropriate help where necessary). The results are to be communicated in a write up of a professional scientific standard, properly referenced and clearly organized.

Learning outcomes
At the end of the research project, a student should be able to demonstrate:

- a depth of knowledge and scholarship in the chosen research area,
- an ability to design an achievable research project (seeking help where necessary),
- an ability to cope with technical issues related to data collection in the chosen research field,
- skills in evaluating evidence collected during the project (including applying and interpreting statistics),
- the ability to draw appropriate comparisons with existing literature,
- and the ability to communicate scientific research at a professional standard using a written report.

The project is to be completed in summer. Full details of format, layout etc. will be available later in the academic year. Students are strongly advised to informally discuss possible projects with potential supervisors in the first semester. Provisional project choices/ directions to be made at end of first semester.

Details of task
1. **Two copies** of the thesis should be submitted in the Biological Sciences Office; additionally, an electronic copy must be submitted to Turnitin. Details of the submission procedure to Turnitin will be made available in advance. Theses may only be submitted late with the permission of the Course Coordinator. Written requests to allow late submission must be made to the Coordinator well in advance of (and at least three days before) the deadline. Such requests should explain the reasons why an extension is warranted and should suggest an alternative deadline. Late submissions result in delays in the examination process with the result that graduation at Christmas cannot be guaranteed. Theses that are submitted late without approval will lose 5% for each working day that the assignment is late, up to a maximum of 5 working days after which a mark of zero will be awarded; this could result in failure of the course.

2. Theses should be typed/word-processed on A4 paper with 2 cm margins on all sides. A minimum 12 point font and 1.5 spacing must be used. Theses should be spiral bound using covers and bindings; these will be available in the Biological Sciences main office at a nominal cost. All text pages should be numbered and sections indexed in a 'Table of Contents'. Figures and Tables should be numbered and include complete legends. The normal form of the thesis would be Abstract (less than 250 words), Introduction, Materials and Methods, Results, Discussion, and Literature Cited. Departures from the normal format should be discussed and agreed with your supervisor(s). In this case, a brief covering page explaining the format you have selected would be appropriate. Acknowledgements and Appendices may be included at your discretion. There are no specific length restrictions/requirements, but 15 000 words (about

50 pages) is a guideline in the university regulations. No penalty based on word counts less than this will be applied. This word count includes all references and figure/table legends.

Theses should not exceed 20,000 words without good reason – what is being assessed is the ability to communicate in a written report and this does not extend to "waffling on" in irrelevant areas. There is no need to repeat material already covered in a literature review. The project introduction is likely to be narrower and more focused that a literature review. You should discuss the level of detail and structure with your supervisor(s).

3. Students should choose an appropriate Journal's format and follow this over questions of style (e.g., to use & or 'and' for citation: Johnson & Montgomery 2005, abbreviated journal titles in reference list or full title, Fig. 1 or Figure 1.). Thesis should name the journal format followed at the end of the 'literature cited' section.

4. The thesis will be assessed by your supervisor, an internal examiner, and (possibly) the external examiner. The thesis will be assessed as indicated on the sample assessment forms.

5. Project and degree/diploma marks will be ratified at the final Examination Board meeting in the autumn, and processed in time for Winter Graduation.

6. **Students should aim to have regular meetings with their supervisor**. As a guideline, <u>five meetings</u> during the course of a project would not be unusual. At these meetings <u>the student should set the agenda</u> in terms of summarising progress so far and the topics and issues to be discussed. Students can expect supervisors to review and comment on written work. In general, supervisors should read through and provide feedback on each section of the write-up once. If a draft write up is to be discussed or reviewed, this should be passed on to the supervisor at least two weeks before the hand in deadline to allow time to read through and give feedback.

7. **Time management is key for a successful thesis**. The expectation is that students spend between 8 and 10 weeks working on the thesis with 2 weeks to write up. This allows time for about two weeks holiday within the summer period. What has caused problems before is when students are slow to start or find that they cannot talk to supervisors at critical times as the supervisor is away at a conference or on holiday. One copy should be left in the course coordinator's pigeonhole for reference. Students should also use the opportunity to link the project into activities within their personal development plan (PDP) on Queen's Online.

8. **<u>Concerns about supervision should be raised with project supervisor in the first instance.</u>** If this does not resolve the issue or the student is concerned about raising it with their supervisor, he or she should discuss the issue with the course coordinator or Head of School. Concerns should be raised at the earliest opportunity. This is preferable to raising issues after the thesis is submitted, where the appeals format is rather inflexible and requires documentation to build a case.

9. **Safety is an essential consideration**. Students must complete a COSHH/field safety risk assessment form if the project involves laboratory and/or field work, and get it signed appropriately. A copy of this form must be included in the project as an appendix. Failure to include a risk assessment, if applicable, will result in no mark being returned for the project module, so this cannot be ignored. Speak to your supervisor for advice on filling out the form. Guidelines for safety in fieldwork are available at on the School's resources on Sharepoint (through Queen's Online).

The basis of the COSHH system is to make individuals aware and responsible for any potential risks. Each project needs its own assessment of risk appropriate to the tasks involved.

Copies of the COSHH form should be kept by project supervisor, students and one copy should be forwarded to George Allen, COSHH Supervisor, Biological Sciences, lab 118. You can use the internal mail or pigeonholes to leave the documents with George.

BBC8001 MSc potential projects available
Students will be expected to work on this **FULL-TIME from April/May until September 2017**, although if there is clear justification for starting earlier (such as a time restricted project) negotiation can set a different timeline.

We strongly recommend that students discuss project areas and possibilities with potential supervisors in the first term, before deciding on a proposed project by the beginning of December (this allows students to link the project with a formal literature review to be written in January). **Titles of potential projects will be circulated by potential supervisors**, but students can discuss their own topics with supervisors and are encouraged to do so. The School can facilitate different kinds of projects, dependent on where students want to aim for after the course (e.g. some policy or management angle for those aiming for NIEA/government jobs or more conventional science for students thinking of a Ph.D.).

To start the discussion of potential projects, we have assembled a list of potential project supervisors/facilitators. This is a non-exhaustive list of ideas: the best thing to do is to arrange a meeting by email with those supervisors that could cover an area of interest (email addresses are below). Ideas not on this list can still be discussed; the main hurdle is making sure that any project is achievable within the time scale available. Conflicts (e.g. two students wishing to do the same project) will be resolved by creative splitting of work or by allocating projects on the basis of continuous assessment marks or some other objective measure.

Guidance Notes for Assessment of MSc Projects
These are intended to guide assessments to an appropriate level in the overview sheets. The final mark will reflect the ratings in individual sections, but will not be a strict numerical average. Supervisor and assessors should fill out section B separately and come to an agreed mark. If agreement is not possible, the course coordinator will seek an additional examiner.

A.   **PROJECT** [Supervisor(s) only, 25% of final grade]

1.   Motivation & application
- -did the student demonstrate interest in/enthusiasm for the work?
- -did they give it appropriate time and effort?

2.   Initiative & organizational skills
- -did the student wait to be told what to do or did they take responsibility for moving the work forward?
- -were they able to organize themselves and effectively communicate, including arranging meetings with you?
- -did they solve problems independently and with imagination, or were they dependent on you to sort them out?

3.   Technical competence (laboratory/field/computer skills)
- (as appropriate to the project) Did the student acquire the necessary field skills, and work efficiently and safely? Did they handle data and subsequent analyses well (including use of computers)?

B.   FINAL REPORT (ALL assessors)

4.   Abstract
- -Is this succinct and written in an appropriate style?
- Does it convey the essential purpose, results and conclusions of the project?

5.   Introduction aims and hypotheses
- -is the problem they are addressing stated clearly and put in context?
- -was the student able to draw appropriately from the literature without 'padding' arguments with irrelevant citations?
- -is the scope of the work made clear (including aims and hypotheses)?

6.   Methods
- -is this adequate for you to determine what was done?
- -is the design of the study appropriate for the questions asked (given the practical constraints of the project)?
- -is the degree of detail appropriate?
- if statistical tests are used are they appropriately explained and justified? This does not extend to routine explanations of a p-value, but should cover the choice of test and considerations of the assumptions and appropriateness of the test(s).

7.   Results
- -are these clearly presented, following appropriate conventions (e.g. as in a scientific paper)?
- -are the use of statistics, figures and tables necessary and well thought-out?
- -are findings clearly distinguished from interpretations (with interpretations limited to the discussion)?

8.   Discussion
- -are interpretations sound and well-reasoned?
- -are results discussed with reference to the literature (good 'scholarship')?
- -are summary conclusions clearly stated and well-supported?

9. **Overall organization**
   - -how well does the write up work in getting the message across?
   - -are references appropriately cited?
   - Is everything drawn together? Do the introduction, methods, results and discussion make up a coherent whole?

10. **Style and presentation**
    - is the style appropriate for Masters level written work (reflecting the conventions of published papers)?
    - is it well-written, proof read or is it a last minute job?
    - are the figures and tables appropriate: do they stand alone; are they all justified; is repetition between tables and figures avoided?

11. **Reflection and innovation**
    - -are strengths and weaknesses of the methods or of the work performed discussed?
    - -are there clear ideas for continuing the work or modifying it?
    - -is there evidence of reflection and consideration of the results in a broader context?
    - -are the results integrated into an evaluation of the existing literature?

Notes on effective scientific writing

1) *Remember, time is the enemy* - Essentially, don't put off until tomorrow what you can do now. Your time will fill up very quickly later on.

2) *Nail down the topic*. Many topics on which you will be asked to write are vague and general. Use you preliminary reading to reflect on the topic and focus on well- defined questions.

3) *Organize*. Mike it clear to the reader where you are going. Figuring this out yourself is a good first step, so produce an outline. Use headings and subheadings. Make sure that each paragraph begins with a clear topic sentence and sticks to that topic. Revise your outline if you need to. What seemed to be a good order at first may not work as the writing develops. Don't be afraid to reorganize.

4) *Work step by step*. Inevitably in the process of writing you will get 'stuck'. Accept this and don't worry about it. When this happens, there are other things you can be doing: type in your references or look for some useful figures to add. Keep working away.

5) *Accept imperfection*. Most writers are frustrated when their first draft isn't what they hoped. Think of the image of the writer crumpling up a page and tossing it into an overflowing bin...this is not the way to write. Accept that it will not be perfect the first time, but write it down anyway. It is much, much easier to revise something concrete than create it out of thin air.

6) *Keep it simple* Good writers engage us because they have a unique style. To start with, focus on clarity and simply getting the point across. Complex sentences are common in literature and science, but are seldom useful in communicating already technical information. Keep it straightforward and simple. It is tempting to use more complicated words. i.e. 'a centrifuge was utilized' vs. 'a centrifuge was used' or 'This essays relates to the subject matter of' vs. 'This essay is about'. Don't use the complicated phrase.

7) *Lead the reader through your writing*. Make comparisons and clear references to what has gone before and what will follow. Cues for the reader include 'signpost' statements like: 'The second important reason is...', or 'There are three competing hypotheses for the species area relationship which will be discussed below:'

8) *Reason and integrate*. Too many writers end up presenting a catalogue of facts without a clear point. Express a point of view, balance arguments against each other and come to some resolution or consensus. Go beyond stating platitudes such as 'more research must be carried out'. State what additional research you recommend. What was wrong with previous research?

9) *Use specific references*. Supporting your arguments with citations is evidence of good scholarship and a real aid to the reader. A reference is appropriate wherever a reader would ask: 'how do you know that?'. Be sure that you reference correctly and in context. No one enjoys being cited as supporting something they do not! Try to integrate your citations into you arguments, e.g. 'While many authors accept that predation structures communities (reviewed in Montgomery et al. 2000), recent work from California suggests that predation is less important than urbanization (Spandex et al. 2003)' is better than 'There is disagreement over predation in communities (Montgomery et al 2000, Spandex et al 2003).'

10) *Proof read*. Nothing detracts from a piece of writing more than obvious errors. Typographical errors can be caught by spell check programs, but they are not foolproof
– they will not catch most grammatical errors and they cannot distinguish sentences that don't make sense. Leave the text alone for a day or two and reread. Give it to a friend and ask him/her to point out places where they can't follow your ideas. When you read through you work try speaking it out loud and be vigilant for sections that make you lose concentration (this is usually a sign that the writing is unclear and will cause your reader to drift off/miss your point).

MSc project assessment overview for ....

	Supervisor(s)	2nd examiner
Names of supervisor(s) & assessor:	....	....

A. PROJECT WORK (Supervisor(s) only, 25%)

Clarification: the aim of this mark is for the student to receive credit for demonstrable skills or application that would be an asset in a workplace. To improve the transparency of this section, supervisors should give clear justifications for marks with reference to the 'Guidance Notes for Assessment of MSc Projects'. Please place a tick to indicate the range of marks allocated to each component and provide a written reasoning for this mark.

	poor/weak			excellent/strong	
numerical indicators:	< 40	40-49	50-59	60 -69	> 70

1. Motivation & application   _____   _____   _____   _____   _____

Justification:

2. Initiative & organizational skills   _____   _____   _____   _____   _____

Justification:

3. Technical competence   _____   _____   _____   _____   _____

Justification:

B. FINAL REPORT ON THE THESIS (Supervisor(s) and Internal Examiners 75%)

The justification should clearly evaluate positive and negative aspects of the work, with reference to the 'Guidance Notes for Assessment of MSc Projects'. Each assessor should provide a completed sheet of marks and justification.

poor/weak   excellent/strong

4. Abstract   _____ _____ _____ _____ _____

Justification:

5. Introduction, aims and hypotheses _____ _____ _____ _____ _____

Justification:

6. Methods   _____ _____ _____ _____ _____

Justification:

7. Results   _____ _____ _____ _____ _____

Justification:

8. Discussion   _____ _____ _____ _____ _____

Justification:

9. Overall organization and clarity _____ _____ _____ _____ _____

Justification:

10. Reflection and innovation _____ _____ _____ _____ _____

Justification:

Level descriptors and marking scale:

>85   **near-perfect**; "as good as the assessor could have done"

70-85   **excellent**; "impressive and worth copying to keep for reference"

60-69   **comprehensive** to **very good**; "creditable effort with minor difficulties"

50-59   **adequate** to **satisfactory**; "the right idea, but some significant problems"

40-49   **deficient** to **incomplete**; "shows a lack of understanding of what is expected"

<40   **abysmal** to **weak**; "unacceptable from a postgraduate student

Grade >50 is needed for to pass the MSc; 70% and higher indicates a very strong piece of work, worthy of a distinction.

Supervisor: _____

Project Grade: _____   Thesis Grade: _____

    Comments for External Examiner:

Internal examiner 1:

_____

Thesis Grade: _____

Comments for External Examiner:

Internal examiner 2:

_____

Thesis Grade: _____

Comments for External Examiner:

Agreed thesis grade   ....

Agreed Final Grade (25% based on Project, 75% based on Thesis):