Dissertation Handbook for MSc CSM and MSc CANES

General

All the information and deadlines relative to your project and the associated report or dissertation will be posted on the relevant KEATS page.

For MSc Complex Systems Modelling (CSM), this is:
• 7CCMCS01, "Individual Research Project", word limit 10,000 words

For CANES, the word limit is 5,000 words and the relevant KEATS pages are
• 7CCMNE07 "Research Methods for Theoretical Modelling of Non-equilibrium Systems"
• 7CCMNE08 "Research Methods for Simulation of Non-equilibrium Systems"
• 7CCMNE09 "Research Methods for Data-driven Analysis of Non-equilibrium Systems"

Selection of Projects (applies to MSc Complex Systems Modelling only)

• A list of projects will be circulated by email in the second week of January. You should read the list carefully.

• **Staff project presentations** will be arranged, where prospective supervisors present their project abstracts to students. Students are encouraged to ask questions at the end of the presentations, to make sure they understand what the projects entail.

• Project abstracts are meant as guidelines, however there is **some flexibility** to tweak the project in a particular direction, depending on the student's interest. You are encouraged to discuss with your perspective supervisor possible directions you may have in mind.

• Students will be asked to rank all the projects by **preference** at the end of the presentations and send it to the programme director.

• A few days later, projects will be allocated to students. We will pick up the allocation that **maximizes the class satisfaction** given the hard constraint of a **fair spread of supervision load** across members of staff. Should a project be ranked highly by many students, supervisors may be asked to indicate the student(s) they think more suitable for their project.

• On average, **every project accommodates three students**. Students who are allocated to the same project, can either work on two different research questions, or tackle the same question from different angles or by using different tools. Students have the option to work together on the preliminary phases of the project, if they wish, as long as the project they deliver is personal and original.

• **Project allocations** will be communicated by email, normally in the fourth week of January. Then, you will meet with your assigned supervisor and discuss further the project with them.

• You will be asked to **read background papers** and to prepare a **project outline.** You will **present orally** your project outline and background references to academic members of staff in the **last week of the second semester**. The presentation will be **assessed** and it will contribute 20% to the overall mark of 7CCMCS07. Indeed, reading and understanding background literature, presenting orally scientific topics and planning ahead your research project are essential research skills that are assessed through the module "Research Methods and Advanced Topic in Complex Systems".

Role of the supervisor

• The supervisor is expected to provide guidance when necessary, to suggest an initial reading list, to advise on possible routes around research problems. The supervisor is not expected to undertake the project work, provide solutions to all problems encountered or supply the full list of papers to be included in the bibliography.

• For CSM projects, student and supervisor are expected to establish a sensible working routine, with students not expecting their supervisor to be available at a moment's notice, and with supervisors making time for sufficiently many consultations. Typically, you may expect to have **one hour of contact time** with your supervisor **per week**, on average, for the duration of the project (June to September). Email or Skype conversations count as contact time.

• For CANES projects, the supervisor is expected to provide support in the form of typically three two-hour group supervision sessions, with dates and times announced at the beginning of the project or later agreed in discussion with the students. The supervisor may offer to provide further support by email, Skype or other means of communication, as time allows.

Project report submission

• The **deadline** for handing in project reports is normally during the first week of September; the precise date will be posted on Keats nearer the time.

• Include a final page with your **self-assessment** of your project report. This should describe how in preparing your report you have followed the guidance in the research methods materials; you should also give your own assessment of your report (including grades) against the published marking guidelines. This one-page self-assessment is a compulsory part of the project write-up.

• By the deadline, you will need to submit

1. an **electronic copy in PDF format** of your dissertation through TURNITIN on KEATS
2. a **signed statement on plagiarism** through KEATS
3. **two hard copies** of your dissertation to the Departmental Office

Late submission

Unless a personal deadline extension was granted, based on mitigating circumstances (see below), coursework submitted after the original deadline receives the following automatic penalties (College Regulation A3-19.5):

• work submitted within 24 hours after the original deadline will be marked but the mark awarded will be capped at the pass mark (50%);
• work submitted more than 24 hours after the deadline will receive a mark of zero
• If you do have mitigating circumstances affecting your ability to complete the coursework by the deadline you should follow the procedures outlined below:

◦ for MSc Complex Systems Modelling:

https://www.kcl.ac.uk/nms/depts/mathematics/study/current/handbook/assess/mcf.aspx

◦ for MSc Non-Equilibrium Systems: Theoretical Modelling, Simulation And Data-Driven Analysis (CANES):

https://www.kcl.ac.uk/innovation/groups/noneqsys/Handbook/MSc-Handbook/Assessment/mcf.aspx

and submit the form plus your supporting documentary evidence to the Mathematics and Informatics Department office.

Students should note that computer failure or ability to connect to the internet from your computer are not accepted as suitable excuses for late submission. In the unlikely event of a KEATS network failure, you will be contacted by the Department office with further instructions.

How and when to write up

• It is important that you do not leave the writing up of your report too late; it frequently happens that good work cannot be given full credit because it is poorly described in the report.

• It is therefore a good idea to write up continuously as you work on the project.

• Make sure you refer back to the research methods material for further advice on note-keeping and writing up.

Guidelines for project reports

• Please adhere to the word limit stated above, which relates to all words in the main text, captions, headings and footnotes. Depending on number of figures etc, 1,000 words correspond to around 3-7 pages, so accounting for title, abstract and references a 10,000 word report would be expected to be 35-75 pages in length, a 5,000 word report 20-40.

• Set the margins (see e.g. http://en.wikibooks.org/wiki/LaTeX/Page_Layout) appropriately: they should be no larger than the Latex default margins, and no smaller than 2cm all the way round. Use 11pt font

• Reports need to contain: title page, abstract, main text, list of references. A table of contents before the main text, which e.g. LATeX can produce automatically, is also helpful.

• Level of detail: the report should contain enough detail for a reader familiar with the material taught in your programme to understand what you have done. If necessary, material that you feel is too technical for the main text can be included in the form of appendices.

• The abstract should be one or two paragraphs long; it should state the problem which the project addresses and the main conclusions and results.

• A possible skeleton structure for the main text is (your supervisor will advise on the relative balance of the various sections):

1. Introduction: This should explain the context of the project and situate it in the broader field of your programme. It should state clearly which problem the project was designed to tackle and with what methodology, and it should give an overview of the structure of the remainder

of the report.

2. Review: This should discuss related work in the area of the project, explaining the differences between the various approaches and the one chosen for the project. If the project uses methods or theoretical techniques not covered in your lecture modules these should also be reviewed.
3. Methodology and results: This will generally consist of several sections. Where appropriate, results should be summarized in figures or tables.
4. Discussion and conclusions: This should be a summary and critical evaluation of what the project has achieved and how the results relate to ones obtained by other people. You should also discuss what could have been done differently and how the approach could be improved or developed further in future work. Re-read the section from the research methods materials on "Critical evaluation".

• Figures: need to be large enough to be decipherable; pay attention to sizes of symbols, error bars, visibility of different linestyles etc. Labelling (axis labels, tick labels along axes, legends etc) needs to be large enough to read, i.e. of the same size as the main text. Give units of data where appropriate.

• All figures and tables need to be numbered and have a self-contained caption, i.e. one that explains what is shown without requiring the reader to go back to the text, including – if the data shown are not your own – the source. All figures and tables need to be referred to and discussed at the appropriate place in the main text.

• The list of references should be formatted consistently and contain all the information which a reader would need to retrieve the items referred to. E.g. for an article from a journal you would normally list, in order: Authors, title of article, title of journal, volume number, page numbers, year of publication. (E.g. "A. N. Other and B. Someone, Gnus versus gnats, Journal of Gnuology, 23:110–113, 2002."). For books also list the publisher; for edited volumes such as conference proceedings also the editors. References to web sites should be used sparingly, since URLs tend to have a rather short half-life, and should mention at least the author(s), title, and give the full URL. We strongly recommend the use of bibtex (together with LATeX) to automatically produce correctly and consistently formatted reference lists; see the research method materials. A typical reference list would contain no less than 5-10 items, and no more than 30 unless the project is predominantly of review character. All references need to be referred to in the main text.

• **Attribution of others' work**: whenever you discuss other work, the appropriate reference should be given unless it is clear from the context. This applies even in, for example, an introductory section. There are of course circumstances where this would be redundant; if a section is devoted to a review of a particular paper or set of papers, then it is sufficient to state this at the beginning of the section.

It is **essential** that any actual quotes from other people's work are identified as such, i.e. you need to say explicitly that you're quoting, and give the reference.
More relevant in practice is the case where you are including a discussion in your report that follows quite closely a particular reference. In that case you really need to put the source reference away and formulate the ideas in your own words. It is generally **not acceptable** to copy sentences from your source and just modify them here and there. (You can do this very occasionally, if you say explicitly that you are paraphrasing, or indeed quoting, and indicate from which source.) Unacknowledged and sustained paraphrasing will be regarded as plagiarism, with potentially serious consequences.

Project submissions may be checked by examiners using the **Turnitin** software if there is a

suspicion of plagiarism. You will have the possibility of submitting your draft report to Turnitin yourself, from the project webpage on KEATS, once this facility is activated. You are encouraged to use this resource to help you avoid inadvertent plagiarism.

For more detailed information on referencing and attribution of others' work, you should also consult the guidelines available from

http://www.kcl.ac.uk/library/help/plagiarism/citing/index.aspx.

The formatting instructions there are largely redundant if you use LATeX, but the guidance on when and how to cite is very relevant and useful.

Oral presentations of Research Projects (CANES only)

• The schedule of the oral presentations is normally within one or two weeks after the submission deadline (i.e. second half of September). Please make sure you are available to give your presentation during this week; the presentations are a compulsory part of the programme. Examiners will use the presentation as additional information for their assessment of the project report, to help them gauge project quality and the logical structure of how the work is presented.

• The presentations will be given to a panel consisting mainly of members of the relevant research groups. Each oral presentation should last about 20 minutes, to be followed by up to 5 minutes of questions from the panel.

• Your presentation should explain the problem the project was designed to address, summarize briefly any relevant background and work by others and then describe your own contributions and the conclusions you have drawn.

• You can do the presentation on the blackboard if you wish, but you may find it helpful to prepare some slides on a laptop, in LATeX (using e.g. the beamer class) or PowerPoint; a departmental laptop can be arranged for you to use in the presentation. Your supervisor can offer further advice if you are unsure.

Oral presentations of Project Outlines (CSM only)

• S**tudent oral presentations** will be held during the last teaching week of the second semester. The time slots are generally those used for the module 7CCMCS07. Please make sure you are available to give your presentation during this week. Presentations are **assessed** and count **contribute 20%** to the overall mark of 7CCMCS07.

• The presentations will be given to a panel consisting mainly of members of the relevant research groups. Each oral presentation should last about **15 minutes**, to be followed by up to 5 minutes of questions from the panel.

• Your presentation should explain the problem you are planning to address in your project, summarize background references and outline your plans for the project, including a description of the aims, the research methods you are going to use (e.g. analytical calculations, simulations), the tools (e.g. Saddle point method, Gillespie algorithm) and a timeline.

• You can do the presentation on the blackboard if you wish, but you may find it helpful to prepare some slides on a laptop, in LATeX (using e.g. the beamer class) or PowerPoint; a departmental

laptop can be arranged for you to use in the presentation. Your supervisor can offer further advice if you are unsure.

General advice on oral presentations

• Speak slowly and clearly; speak freely rather than reading from your slides or from notecards.

• Stand next to rather than in front of the screen to avoid blocking the audience's view. Face your audience rather than the screen or board.

• Explain at the beginning (e.g. using an initial "here are the sections I'm going to cover" slide) what you're going to cover in your talk; you can return to this overview slide as you go through the material.

• Make sure you explain what any figures show: have clear (and sufficiently large) labels on the axes and explain in words what they mean.

• Talk the audience through any equations you show, explaining all symbols; avoid flashing up lengthy equations without giving the audience time to digest them. Explaining in words how a calculation proceeds or what results it gives can often be more useful than trying to show all details.

• Use a large font (or large handwriting) and don't cram too much material onto one slide. For text, use a bullet point style rather than writing whole sentences. The default fonts of the LATeX beamer package provide very sensible font size settings; do not try and make them smaller.

Marking Guidelines

• The correspondence between literal marks and percentage marks is:

0-49	F	Fail
50-59	C	Pass
60-69	B	Merit
70-100	A	Distinction

• The report is initially assessed independently by two examiners, the first examiner being the project supervisor.

• Each examiner assigns a numerical grade, as defined above, reflecting the candidate's performance in relation to each of the following criteria:

1. [only for the supervisor's mark in individual research projects] Student initiative and amount of guidance required
2. Scientific quality: how well the material in the project scope has been covered, e.g. are methods being used correctly, have results been discussed critically
3. Breadth: the amount of background material, over and above lecture module content, that the student has incorporated into the project
4. Originality: the extent to which the student has contributed own ideas, perspectives etc to the project
5. Presentation and logical structure of the report, including English style, readability and coherence of the report as a whole, quality of the abstract, introduction, figures and reference list and the way the latter two are co-ordinated with the text.

These grades, together with a recommended overall numerical and literal grade, as defined above, should be incorporated in a written report justifying the grades.

Note also that:

1. Grade F should be awarded if the material, though correct, is judged to be wholly copied in a mechanical manner.
2. The relative weight of the above criteria will not normally be uniform, and may depend on the type of project carried out. Serious failures in individual areas should also be reflected in the overall mark.
3. Reports *substantially* longer (by 20% or more) than the set word limit will be penalised.

• Further guidance concerning the definitions of the relevant mark boundaries is enclosed. Examiners are encouraged to make full use of the 0-100 range of numerical marks. A mark at the top of the 70−100 range should imply that the work done is of sufficiently high quality to possibly form the nucleus of a scientific publication.

• Where the examiners arrive at different overall marks, they will be asked to consult and propose an agreed compromise mark.

• The proposed project marks will then be considered by the internal and external examiners before final marks are agreed at the examination board meeting.