Mathematics Assignments Handbook 2016-17

MATH5003 Assignment in Mathematics (30 credits)

MATH5004 Assignment in Mathematics (40 credits)

Module Coordinator:

Prof M. Rathjen   (M.Rathjen@leeds.ac.uk)

Project Coordinator for Applied Mathematics:

Dr O. Chalykh   (O.Chalykh@leeds.ac.uk)

Project Coordinator for Pure Mathematics:

Prof M. Rathjen   (M.Rathjen@leeds.ac.uk)

Project Coordinator for Statistics:

Dr L. Bogachev   (A.Veretennikov@leeds.ac.uk)

1   Introduction

This handbook is intended for use by students and staff involved in mathematics assignments. Hopefully, it should contain all the information that they need regarding the relevant modules. If this is not the case, or if you find any typos, inaccuracies or contradictions, then contact Prof M. Rathjen via M.Rathjen@leeds.ac.uk.

Level 5M assignments are opportunities for a student to study a topic in mathematics and develop skills such as writing reports and giving presentations. The student will be monitored by a supervisor, who will periodically set tasks and discuss the progress of the work. The assignments run over two semesters. Assessment will be based on the report submitted at the end of the academic year and an oral presentation together with the supervisor's comments.

All MMath students must take a level 5/M assignment in year 4 of the programme. This does not stop them taking a project module in their third year (either MATH3000 or MATH3001).

The amount of work required for project modules depends on the number of credits. For all modules the standard University rules imply that a ten-credit module involves 100 hours of student work.

Module	Credits	Meeting/ Supervision hours	Private study hours	Report length	Oral Presentation
MATH5003	30	12	287	50-60 pages	20+15 mins
MATH5004	40	16	383	60-70 pages	25+15 mins

These notes are intended as guidance, and should be read in conjunction with the relevant module description in the University Catalogue `http://webprod1.leeds.ac.uk/catalogue/modulesearch.asp?T=S&L=UG`.

One aim of project work is that students should enjoy an opportunity to study independently and hence should be allowed a certain amount of leeway how they do the project. This is best done by agreement between students and supervisors and so although these notes contain certain rules (e.g., supervisors should meet students in Weeks 1-2 of the semester and provide a written outline of the project) it is important that both parties feel able to negotiate between themselves an appropriate course of action in most instances. A key aim is that students should be given the opportunity to show their strengths.

2   Allocation of supervisors and assessors

The process of allocating supervisors begins informally before the academic year begins as many students like to start their projects early and so that supervisors can plan their teaching.

The allocation to a supervisor will be made as far as possible to accommodate the wishes of the student as to subject area, though latecomers may have more

limited choice. Once each student has been allocated to a supervisor, the precise topic to be studied will be agreed between the two.

It is the responsibility of the module coordinator to ensure that each student has a supervisor by the end of Week 1 of the academic year, although *in exceptional circumstances* this may not be possible. The ideal situation is one in which all supervisors are allocated before the start of Week 1. An appropriate assessor should be agreed by end of the third week of Semester 1.

The module coordinator should contact all students and supervisors in Week 5 of Semester 1 to check whether there are any problems. This is an important opportunity to catch problems before they become serious. Students should be aware that it is very difficult to change supervisors once the module has started and so any issues, such as change of supervisor or project, should be dealt with as early as possible.

3   Choice of Topic

Lists of topics are available on the module areas on the Blackboard/VLE and/or module websites.

The level and amount of material for the 30-credit and 40-credit modules should approximately correspond to 20 or $26\frac{2}{3}$ credits (respectively) of a standard level 5 module. Much of the material will usually be available in textbooks, although the development of a topic should not follow any one textbook completely, and the student will be expected to consult other literature *including research articles in journals*.

In Statistics an assignment may not neatly fit the above description, but may include other characteristics such as the following: (i) a substantive analysis of a specific dataset, (ii) a comparison of the strengths and weakness of different statistical methods, and (iii) writing computer code in R to implement a statistical analysis or to simulate data.

4   Supervision

At their first meeting in weeks 1-2 of Semester 1, the supervisor will provide the student with an outline of the agreed topic, together with appropriate reading such as textbooks and/or articles. This should be considered a guide as the student may have their own suggestions.

The student will be able to consult the supervisor in case of difficulty. The time for consultation is officially limited to twelve or sixteen hours for the 30-credit and 40-credit assignments, respectively. However, most supervisors are flexible about this and a weekly meeting is not uncommon. The student and supervisor should agree the timing of meetings.

5   Advice to students on tackling the project

You are expected to draw up detailed notes on the topic, profusely illustrated with examples and counter-examples. The final format of the report will depend on the subject area and topic chosen. One common format is that the completed set of notes should be, as near as possible, the sort of notes and examples a student would be expected to collect during a lecture course. This can involve paraphrasing material from a textbook, and solving problems in textbooks to which the answers are not provided. However, there are other formats. For example, in Statistics the project may involve analysing data and in Applied mathematics and Statistics may involving writing computational code.

Students are ultimately responsible for their projects; supervisors give guidance and advice. The final report should be in your own words rather than a regurgitation of someone else's work. All work must be submitted with a statement of academic integrity. Furthermore, any submitted work will be uploaded to a plagiarism detection system.

How to write a good project

(i). Lots of advice on writing mathematics can be found in Chapters 3 and 4 of Kevin Houston's book, *How to Think Like a Mathematician*. For example, write in sentences, explain notation, and when you give a definition, give an example (or two).

(ii). Give answers to challenging questions. Markers are more likely to be impressed by your solution to harder exercises. (As a guide, Exercise 14.8 from a book is likely to be harder than Exercise 1.1.)

(iii). Give your own examples after definitions.

(iv). Generalize results.

(v). Deviate from the standard text. Do not just follow the definition, theorem, proof sequence given in a particular textbook. Work out what is important about what you want to say and decide for yourself what should be a lemma, a theorem, a definition.

(vi). Collect from a variety of sources. What is the point of just rewriting every sentence from the standard text book?

(vii). Use consistent notation. Different books use different notation. If you replace the notation in the correct places, then you demonstrate understanding.

(viii). Tell us what you have added: Eg., 'In [6] Smith sketches a proof that every grundle is rationally elliptic, here I shall give the details.' Another example is 'Jones' proof in [12] is incomplete as she asks the reader at two points why a statement is true. I have provided the answers.'

(ix). If you have to take something verbatim from a source, then quote the source and demonstrate that you understand it by giving a pertinent discussion or a good example.

(x). Make sure the account is clear (e.g., words in theorems are defined) and logical (e.g., the definitions come *before* the theorem).

(xi). When analyzing data in Statistics, take care to describe exactly what statistical methods are being used and how they enhance the understanding and interpretation of the data.

(xii). Use appendices, for example for original source code of numerical work.

(xiii). Use a number of sources from journals.

A key point is that you should *demonstrate* that you understand what you have written. You do not want the marker to think that everything has just been copied without any thought. Markers are more likely to reward independence and students being proactive, but that should not stop you from asking for help and advice. Moreover, having fewer meetings with the supervisor or not seeking their advice should not be used as a criterion for independence.

6 The interim report

Students must submit an interim report at the end of Week 11 of term 1. For the academic year 2016-17 this is

Level 5M Assignments Interim Deadline
Friday 9 December 2016

The interim report should consist of a report on the work covered so far, for example sample chapters, notes and examples. What constitutes a serious attempt at a report will vary depending on the topic. Students should ask their supervisor for guidance. It should include brief details of the intended content of the rest of the project.

The interim report should be submitted to the assessor. The assessor should then provide *written* feedback on the work undertaken so far by making suggestions, corrections, and comments.

Unless *exceptional* circumstances prevent it, the interim report and a copy of feedback should be returned to the student (and a copy to the supervisor) by the start of Term 2. This will give the student plenty of time to correct any deficiencies.

7 Submission of project

The final report should be submitted in **two bound hard copies** to the supervisor and **electronically via the module VLE page**. The supervisors will promptly

pass one copy to the relevant assessor. The electronic versions should be in Word, dvi, postscript, pdf or some other common format. (Electronically scanned copies of a wholly handwritten report are not permitted.) Students must keep a copy of the report for their own records.

The submission must be accompanied by an academic integrity form (the form can be found on the module area on the Blackboard VLE) and will be checked for plagiarism using the standard University software. If any plagiarism is suspected, the standard University procedures on plagiarism will be followed. Information on what consitutes plagiarism can be found in the University Taught Student Guide.

The deadline for submission is the end of Week 11 of Semester 2. For the academic year 2016-17 this is

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Level 5M Assignments Final Report Deadline
Friday 5 May 2017

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In accordance with University rules, late submission results in a deduction of 5 marks (out of 100) per calendar day. If a student is unable to submit the work, for whatever reason, then they should contact their supervisor or module coordinator as soon as possible. Students are reminded that information on special circumstances can be found on the School of Mathematics website.

The final project should include a summary (typically, in the introductory section) describing the scope of the work and the main results, indicating the main sources used.

Pages and sections should be numbered for easy reference and the title page should contain student name, student number, module code and title, title of project, supervisor and the date of submission.

The report should include a contents page and a full bibliography, indicating all the books, articles or websites used.

Recall that, in the text, if a lemma or theorem is taken from some source, there must be an indication of the source, and whether it has been significantly expanded or adapted. Apart from short statements, students should not copy directly from sources, and everything must be expressed in the student's own words, except where explicitly stated. Students whose work is too closely based on their sources will have marks deducted.

Summary

(i). Title page: Name, number, module, title, supervisor, date.

(ii). Academic integrity form.

(iii). Contents page.

(iv). Numbered pages (and sections)

(v). Summary or work and sources (usually within the inroduction).

(vi). Bibliography of sources used.

(vii). Bound. (Don't forget to leave time for binding!)

(viii). Upload to VLE.

Typesetting using LaTeX

It is recommended that you use the LaTeX typesetting package to produce your report, which is available on the University network (the best version is called TeXworks), or can be downloaded freely from the web. As you may know, LaTeX is a typesetting package designed for writing mathematical reports. There are many LaTeX tutorials along with other documentation on the web. For example, you may find it helpful to consult `http://www.maths.leeds.ac.uk/latex/` and `http://www.maths.leeds.ac.uk/latex/texworks23.pdf`.

There are also many LaTeX editors that you may find useful and facilitate the writing of your report. A good LaTeX editor is TeXstudio that you can freely download from `http://texstudio.sourceforge.net/`.

Duties of supervisor and assessor after submission

After submission of the report, the supervisor will promptly pass the report to the assessor. The supervisor should keep the other copy of the report.

The project will be marked by the assessor. It is recommended that the assessor discusses the report with the supervisor before the oral presentation. The assessor will fill out the relevant sections on the assessment pro-forma which can be found at `https://www1.maths.leeds.ac.uk/local/staff/teaching/Project_Assessment_Form_1415.doc`.

The section on initaitive and independence should be based on the input from the supervisor. The mark components which are informed by the presentation and questioning will be finalised after the oral presentation.

8   Oral Presentation

A time and venue for the presentations will be arranged for each student during the May/June examination period. There will be opportunity to practise these presentations beforehand. Module coordinator will inform students in good time of the date and place of the presentations.

The format of the presentation will vary depending on the subject. In Pure and Applied Mathematics students generally give a 20-25 minute talk and there is 10-15 minutes for questions from the panel. In Statistics the talk may be shorter and the question section longer.

The key to a presentation is that the student should demonstrate understanding. Given the time constraints it will be impossible for students to explain every

detail from their report. Thus students should choose some aspect, e.g., a theorem or set of examples, and use that to demonstrate that they understand the material in the report.

There are two main aims to the presentation:

(i). Students should demonstrate that they understand and have mastered the material.

(ii). Students should demonstrate their presentation skills.

Students can make the presentation in any format they like, eg OHP slides, Power-Point, black/white board, video, flip-chart, etc. Students should inform the module coordinator at least one week ahead of time of their requirements for the presentation. It cannot be assumed that the room for the presentation will contain a computer with every possible computer program. *Students are advised to bring electronic files on a memory stick as occasionally wi-fi connections etc do not work.*

The **assessment panel** of the project consists of

(i). module coordinator,

(ii). supervisor,

(iii). assessor,

(iv). other members of staff who wish to attend, for example, for moderation purposes.

The other members of staff who wish to attend can ask questions, make comments and give their opinions. Other students are not allowed to attend.

Whilst being sensitive to a student struggling during a presentation, supervisors should avoid answering questions for them. (Panel members often ask questions not because they want to know the answer but because they want to know if the student knows the answer!)

After the presentation the student will leave and the panel will discuss the presentation and report. An initial mark will be agreed. After all projects have been assessed, the module coordinators can moderate marks taking into consideration fairness and consistency. The module coordinator is responsible for the final module marks.

Advice to students on presentations

- The presentation will pass by quicker than you think so plan carefully.

- Cover some part of the material in depth rather than all parts superficially.

- A good example is worth a thousand words.

- Latex reports can be quickly turned into a 'Powerpoint' type presentation by using the Latex package Beamer. (Google 'Latex beamer'.)

- Practise in front of friends and family, even those that have no understanding of mathematics. This will give you confidence and you will be less nervous. It also allows you to judge the timing.

- Imagine that the presentation is for a job interview or a pitch to a client.

- Does it look professional?

9 Post-Assessment and feedback

The assessors are responsible for filling out the assessment and feedback form, with the input of the supervisor to the 'Initiative and Independence' section.

The module coordinators are responsible for ensuring that all marks are collected, moderated, and submitted to the Mathematics Undergraduate Office by the relevant University deadlines. They are responsible for collecting the reports from the assessors and ensuring that they are ready for the external examiners.

A copy of the final assessment pro-forma form will be sent to the student via e-mail and therefore should contain comments and *constructive* criticism. (Assessors should avoid unhelpful phrases like 'Could have been better' for example.)

Assessors and supervisors should be aware that all assessment documentation written by them may be made available to the student and the external examiner.

10 Responsibilities

Module Coordinator

(i). Ensure that websites and VLE sites have material relevant to the new academic year before it begins. To include:

   (a) This handbook.
   (b) Academic integrity forms.
   (c) Assessment and feedback pro-forma.

(ii). Matching of supervisors and students by end of Week 1 of academic year.

(iii). Assign assessors by end of Week 3.

(iv). Check for problems in Week 5 by emailing students and supervisors.

(v). To send email reminders to students and supervisors regarding deadlines. This can be partially automated using the VLE.

(vi). Organize presentations.

(vii). Ask students for their presentation requirements.

(viii). Ensure fairness and consistency in the assessment process. Moderate marks if necessary.

(ix). Prepare marks and projects for external examiner.

(x). Send completed feedback pro-forma to student.

Supervisor

(i). To meet with student in Weeks 1-2 of Semester 1 to discuss project.

(ii). Provide project outline to student and (later) to assessor.

(iii). Provide advice and support to students during meetings/supervisions.

(iv). To report any concerns regarding student work (such as no supervisions) to module coordinator in good time.

Assessor

(i). To read interim report in good time and provide feedback within good time.

(ii). To read the final report in good time.

(iii). Complete the the relevant sections of the assessment form *before* the presentation.

Student

(i). Contact potential supervior(s) in good time to allocate a project.

(ii). Arrange and attend supervision meetings.

(iii). To be aware of deadlines.

(iv). Submit work by deadlines.

(v). Not plagiarize.

(vi). Ensure to be registered for the module in good time. Read and reply to e-mails.

(vii). Communicate their needs for presentation (such as Powerpoint, blackboard) to module coordinator at least one week before the presentation.

11 Timeline

Time	Action
Pre academic year	Module coordinator updates VLE and websites
	Informal allocation of supervisors
Semester 1	
Week 1	Final allocation of supervisors
	Students and supervisors meet
Week 2	Final allocation of supervisors
	Students and supervisors meet
Week 3	Final allocation of assessors
Week 5	Module coordinator contacts students
	and supervisor to check progress/issues
Week 11	Interim report
Friday 9 December 2016	
Semester 2	
Week 1	Assessors return feedback
Week 11	Final reports
Friday 5 May 2017	submitted to supervisor and to the VLE
May/June exams	Oral presentations
June	Feedback returned to students
June	Documentation prepared for Examination Board

12   Assessment Guidelines

The following is meant as a guidance to what constitutes a particular mark. Comments on the assessment pro-forma should refer to some of these criteria.

Class I, 70-100

- Extremely well organized and presented.

- Project could serve as a basis for a course at the appropriate level.

- Excellent choice of examples and logical flow.

- Required little help from supervisor (relative to difficulty of topic).

- Good evidence of originality and independent thinking.

- Mastery of material.

To achieve a Class I students do not need to have achieved mastery or excellence in all the above. Greater marks will be given for originality and evidence of independent thinking.

The full range of marks from 70 to 100 should be considered with the following criteria in mind:

Class I, 95-100 Excellent in all criteria. Of publishable quality.

Class I, 85-94 Excellent in most criteria and highly competent in others, shows mastery of the material. Could be used as a basis for a course in the material without many changes.

Class I, 75-84 Excellent in many criteria and competent in others, demonstrating a high degree of mastery of material.

Class I, 70-74 Excellent in many criteria and competent in others, though demonstrating a high degree of mastery with some minor gaps.

Class IIi, 61-69

- Well organized and presented.

- Good choice of examples and logical flow.

- Required a reasonable amount of help from supervisor (relative to difficulty of topic).

- Some evidence of independent thinking. Follows standard texts sometimes.

- Sound understanding of material.

- Project could with some significant corrections be used as a basis for a course on the material.

Class IIii, 50-59

- Adequately organized and presented.

- Reasonable choice of examples and logical flow.

- Required a substantial amount of help from supervisor (relative to difficulty of topic).

- Little evidence of independent thinking. Tends to follow sources.

- Some good understanding of material.

Note: At Level 5, the pass mark is 50%.

Class III, 40-49

- Poorly organized and presented.

- Poor choice of examples and logical flow.

- Required a significant amount of help from supervisor (relative to difficulty of topic).

- No evidence of independent thinking. Slavishly follows sources.

- Some understanding of material.

Fail, 0-39

- Almost non-existent organization and presentation, for example sections missing.

- No new examples. Illogical arguments.

- Required a substantial amount of help from supervisor (relative to difficulty of topic) or did not see supervisor.

- No significant understanding of material demonstrated.