Course Outline

Mathematical Communication

MATH 2024 Study Period 5 - 2015

Internal - Mawson Lakes Campus

University of
South Australia

Introduction

Welcome

Welcome to Mathematical Communication!

Mathematics is sometimes referred to as a language of its own, and indeed learning to use the logic and symbols of mathematics is much like learning a foreign language. Mathematics plays a vitally important role in our world and is the basis for all the technology, engineering, finance and economics that drive our society. In order to apply mathematics appropriately, mathematicians and others who use and teach mathematics must be able to communicate well. These people include, among others, engineers, economists, scientists, teachers and the general public. Thus it is just as important for mathematicians and others who use mathematics to communicate effectively through the written and spoken word as it is for other professions.

This course is designed to provide students with the knowledge and skills to communicate mathematical ideas, in three important ways. First, you will learn tools to help you write professional documents containing written and mathematical text. Second, you will develop your oral presentation skills. Third, you will acquire skills and knowledge that are useful for managing large projects.

We hope you enjoy Mathematical Communication!

L.W.

Course Teaching Staff

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* Please refer to your Course homepage for the most up to date list of course teaching staff.

School Contact Details

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Course Overview

Prerequisite(s)

There are no prerequisite courses to be completed before this course can be undertaken.

Corequisite(s)

There are no corequisite courses to be completed in conjunction with this course.

Course Aim

To prepare students in areas of technical and written communication in the Mathematical Sciences.

Course Objectives

On completion of this course, students should be able to:

CO1. use techniques of mathematical communication appropriate for writing a paper, writing a thesis or preparing a talk

CO2. developing a literature survey

CO3. the use of the mathematical typesetting software LaTeX

CO4. gain a perspective on the collective international endeavour that is mathematics

CO5. the application of project management to major projects, together with consultant-client communication

CO6. understand culture in the context of mathematics, deepen awareness of how a person's background can shape attitudes and behaviour, and relate this awareness to Indigenous Australians and culturally diverse groups

CO7. clarify career direction, analyse required knowledge, skills and attributes for this direction, and develop a timeline for acquiring them

Upon completion of this course, students will have achieved the following combination of Graduate Qualities and Course Objectives:

	Graduate Qualities being assessed through the course						
	GQ1	GQ2	GQ3	GQ4	GQ5	GQ6	GQ7
CO1	•		•			•	
CO2	•	•				•	
CO3	•		•			•	
CO4							•
CO5	•		•	•	•	•	
CO6		•			•	•	•
CO7	•	•				•	

Graduate Qualities

A graduate of UniSA:

GQ1. operates effectively with and upon a body of knowledge of sufficient depth to begin professional practice

GQ2. is prepared for life-long learning in pursuit of personal development and excellence in professional practice

GQ3. is an effective problem solver, capable of applying logical, critical, and creative thinking to a range of problems

GQ4. can work both autonomously and collaboratively as a professional

GQ5. is committed to ethical action and social responsibility as a professional and citizen

GQ6. communicates effectively in professional practice and as a member of the community

GQ7. demonstrates international perspectives as a professional and as a citizen

Course Content

A selection of topics from: Mathematical writing, English usage, writing a paper, writing a talk, giving a talk, preparing a poster, the use of the document preparation software LaTeX, conducting a literature survey, client-consultant communication, operational and technical aspects of project management, the use of web-based mathematical resources.

Teaching and Learning Arrangements

Lecture	2 hours x 13 weeks
Computer Practical	1 hour x 13 weeks
Tutorial	2 hours x 13 weeks

Unit Value

4.5 units

Additional assessment requirements

Students are expected to attend all lectures, tutorials and computer practicals, due to the participatory nature of the course material.

Learning Resources

Textbook(s)

You will need continual access to the following text(s) to complete this course. Where possible the Library will make the book available for student use. Please check the Library catalogue before purchasing the book(s). The Library will always seek to purchase resources that allow an unlimited number of concurrent users, however availability is dependent on license arrangements with book publishers and platforms. http://www.library.unisa.edu.au

Nicholas J Higham (1998). *Handbook of Writing for the Mathematical Sciences* (2nd edition). Society for Industrial and Applied Mathematics.

Reference(s)

George Grätzer, More Math into LaTeX, 4/e, Springer, New York, 2007.

Scott Berkun, The Art of Project Management, O'Reilly, 2005.

Stephen G. Krantz, Handbook of Typography for the Mathematical Sciences, Chapman & Hall/CRC, 2001.

Materials to be accessed online

learnonline course site

All other course related materials can be accessed through your learn**online** course site which you will be able to access from the my Courses section in myUniSA.

myUniSA

All study related materials can be accessed through: https://my.unisa.edu.au

Assessment

Assessment Details

Details of assessment submission and return are listed under each assessment task. Assessment tasks will be returned to you within two to three weeks of submission.

If the Course Coordinator allows submissions in hard copy format, you will be required to attach an Assignment Cover Sheet which is available on the <u>learnonline student help</u> and in myUniSA.

Assessment Summary

#	Form of assessment	Length	Duration	Weighting	Due date (Adelaide Time)	Submit via	Objectives being assessed
1	Mathematical typesetting	500 word equivalent	N/A	10%	26 Aug 2015, 4:00 PM	learnonline, In person	CO1, CO3
2	Indigenous knowledge (ICUP)	500 word equivalent	N/A	10%	9 Sep 2015, 4:00 PM	learnonline, In person	CO1, CO3, CO5, CO6
3	Good mathematical writing	500 word equivalent	N/A	10%	14 Oct 2015, 4:00 PM	learnonline, In person	CO1, CO3
4	Career planning	500 word equivalent	N/A	10%	21 Oct 2015, 4:00 PM	learnonline, In person	CO5, CO7
5	Mini-presentations - 5 minutes per week	500 word equivalent	N/A	10%	Weekly	In person	CO1
6	Expository Paper project and presentation	2000 words equivalent	2 x 10 minute oral presentations	50%	*See assessment activities for details*	*See assessment activities for details*	CO1, CO2, CO3, CO4, CO5

Feedback proformas

The feedback proforma is available on your course site.

Assessments

Assignment 1: Mathematical Typesetting (Graded)

Students will be given pieces of text to be converted into a .pdf document using the LaTeX typesetting software. This exercise will require the LaTeX techniques discussed in the first three weeks of classes, including the use of special characters and commands; formatting using paragraphs, line breaks and page breaks; the use of titles and sections; LaTeX environments such as the center environment; the incorporation of tables and figures into a document; and some basic mathematical typesetting.

Assignment 2: Cultural Awareness (Graded)

The aims of this assignment are (1) to deepen awareness of how a person's background (notions of culture etc.) can shape their attitudes and behaviour; (2) to relate this awareness to Indigenous Australians and culturally diverse groups, and (3) to understand culture within the context of mathematics and professional practice. Students will use reflective thinking to explore their concepts of culture. They will begin with a panel and discussion in class, next respond to several threads in an online discussion forum, then reflect on how their awareness of the concept of culture has changed, and finally write a 700-word document summarising their reflection and learning.

Assignment 3: Good Mathematical Writing (Graded)

This assignment will include exercises in the creation of a document that requires more sophisticated mathematical typesetting, including an annotated bibliography. The assignment will also include some material on English usage and on writing a mathematical paper.

Assignment 4: Career Planning (Graded)

Students will prepare a job application in response to an advertised position. The application will include a resume and a cover letter.

Mini-presentations: 9 x 5 minutes (Graded)

Each week for 9 weeks, during lectures, each student will give a 5-minute talk to another student on a mathematical topic. The topics for these talks will be provided by the Course Coordinator.

Expository Paper project and presentations (Graded)

Assessment Activities

Name	Sub-weighting	Due date (Adelaide Time)	Submit via
Talk 1 on Expository Paper	10%	27 Aug 2015, 9:00 AM	In person
Draft of Expository Paper	20%	2 Sep 2015, 4:00 PM	learnonline, In person
Final Expository Paper	50%	28 Oct 2015, 4:00 PM	learnonline, In person
Talk 2 on Expository Paper	20%	2 Nov 2015, 2:00 PM	In person

Expository Paper topics will be provided and discussed in class in Week 1. Students must select their paper topic and notify the course coordinator by no later than the Monday of Week 2 so that they can discuss their proposed topic individually with the Course Coordinator during Week 2. Students will also meet the Course Coordinator in Week 7 to review their draft Expository Paper, which is due in Week 6. Individual 10-minute appointment times will be set up.

Each student will give two short talks on their Expository Paper topic: an introduction to the topic (Week 5) and a report on their work (Week 13).

Supplementary Assessment

Supplementary assessment will be available to students under any of the following conditions only if the school board or delegated committee reasonably expects that the student could achieve a supplementary pass in the course:

1. Students undertaking a full-time load of 13.5 units or more per study period will require a Grade Point Average (GPA) of 2.80 or greater for studies undertaken in the six months immediately preceding and relevant to the academic review period.
2. UniSA may use discretion in applying the GPA requirement to students who have undertaken less than 13.5 units per study period in the six months immediately preceding and relevant to the academic review period. Supplementary assessment will not be awarded to a student who has failed greater than 50% of the course load attempted in the six months immediately preceding and relevant to the academic review period.
3. The student must have received a final grade of F1 (Fail Level 1) in the course.
4. The student may be awarded supplementary assessment in a maximum of two courses in a study period, provided that student has passed at least one course in the six months immediately preceding and relevant to the academic review period.
5. Supplementary assessment will not be awarded for a final grade of Fail Level 2 (F2), unless the student is undertaking the final courses of their program.
6. Specific arrangements for supplementary assessment or examination may be made for a student who is undertaking the final courses of their program, whether or not the courses are approved for supplementary assessment. A student is defined to be undertaking the final courses of their program if they have nine or fewer units remaining to complete the program.

More information about supplementary assessment may be found by consulting the relevant policy: http://w3.unisa.edu.au/policies/manual/default.asp (section 7)

Important information about all assessment

All students must adhere to the University of South Australia's policies about assessment:
http://w3.unisa.edu.au/policies/manual/default.asp.

Students with disabilities or medical conditions

Students with disabilities may be entitled to a variation or modification to standard assessment arrangements.

Information for students with disabilities is available at:
http://www.unisa.edu.au/Disability/Current-students/

Variations to assessment tasks

Variation to assessment methods, tasks and timelines can be provided in:

Unexpected or exceptional circumstances, for example bereavement, unexpected illness (details of unexpected or exceptional circumstances for which variation can be considered are discussed in clauses 7.8 & 7.9 of the Assessment Policy and Procedures Manual). Variation to assessment in unexpected or exceptional circumstances should be discussed with your course coordinator as soon as possible.

Special circumstances, for example religious observance grounds, or community services (details of special circumstances for which variation can be considered are discussed in clause 7.11 of the Assessment Policy and Procedures Manual). Variations to assessment in expected circumstances must be requested within the first two weeks of the course (or equivalent for accelerated or intensive teaching).

More information about variation to assessment may be found by consulting the relevant policy: http://w3.unisa.edu.au/policies/manual/default.asp (section 7).

Academic Integrity

UniSA is committed to fostering and preserving the scholarly values of curiosity, experimentation, critical appraisal and integrity. Students are expected to demonstrate high standards of academic integrity.

Academic integrity is a term used at university to describe honest behaviour as it relates to all academic work (for example papers written by staff, student assignments, conduct in exams, etc) and is the foundation of university life. One of the main principles is respecting other people's ideas and not claiming them as your own. Anyone found to have used another person's ideas without proper acknowledgement is deemed guilty of Academic Misconduct and the University considers this to be a serious matter.

The University of South Australia wants its students to display academic integrity so that its degrees are earned honestly and are trusted and valued by its students and their employers. To ensure this happens and that students adhere to high standards of academic integrity and honesty at all times, the University has policies and procedures in place to promote academic integrity and manage academic misconduct for all students. Work submitted electronically by students for assessment will be tested using the text comparison software Turnitin.

More information about academic integrity and what constitutes academic misconduct can be found in Section 9 of the Assessment Policies and Procedures Manual (APPM) at: http://w3.unisa.edu.au/policies/manual/ or on the Learning and Teaching Unit website at: http://w3.unisa.edu.au/ltu/integrity/default.asp

Submission and return of assessment tasks

See above under Assessment details.

Action from previous evaluations

You are invited to provide feedback on the course by answering the standard myCourseExperience questionnaires.

You are also invited to fill in an informal midterm evaluation, about a third of the way through the study period. These evaluations will be done in class on paper. They will go only to the Course Coordinator, and are intended to give a snapshot of how students are finding the course and any suggestions for changes, while there is still time to make changes.

Conceded and Terminating Passes

Conceded and Terminating passes are not available in this course.

Course Calendar

Study Period 5 - 2015

	Weeks	Topic	Tutorial	Practical	Notes	Assessment Details (Adelaide Time)	Public Holidays
	13 - 19 July	Pre-teaching					
	20 - 26 July	Pre-teaching					
1	27 July - 2 August	Course overview. Introduction to LaTeX typesetting software. Intro to Indigenous Content in Undergraduate Programs (ICUP). Advice on giving maths talks. Set up mini-talk 1 for Week 2.	Continue LaTeX topics. Go through topics for Expository Paper.	LaTeX exercises in computer lab.	Choose topic for your Expository Paper. Write a few dot points about your topic.		
2	03 - 9 August	Mini-talk 1. Intro to Career Services. More on LaTeX: typesetting text using LaTeX, special characters, dashes, fonts, lines, paragraphs, pages, spacing, sections, table of contents, cross-references, title, the `center' environment, list environments. Good Problems 1: Laying out the Problem.	In computer lab. LaTeX exercises.	Library Workshop 1: Searching, catalogues, references, the Library homepage.	Students meet Course Coordinator individually about Expository Paper topic. Bring your written sentences. 10 minutes.		

3	10 - 16 August	Mini-talk 2. More on LaTeX: tables, figures, math environments, formatting your texfile, text in math mode, displayed equations. Good Problems 2: Flow.	In computer lab. LaTeX exercises.	Library Workshop 2: Databases. The Library's Math 2024 Assignment Help website. Worksheet: searching for information on Expository Paper topic.	
4	17 - 23 August	Indigenous Culture in Undergraduate Program (ICUP) cultural competency session. Minitalk 3. LaTeX: maths symbols, equation alignment, arrays, matrices, cases.	Bibliographies using `thebibliography'. Menuhin sample article. Mathematical writing using LaTeX. More on equation alignment, arrays.	Set up and test texfile for your Expository Paper. Start drafting some content.	Start work on ICUP online discussion forum. Review Week 1 advice on giving maths talks. Start preparing Talk 1.
5	24 - 30 August	ICUP panel discussion.	Student 5-minute talks on Expository Paper topic. Bibliographies using BibTeX. Good Problems 3: Mathematical Symbols.	Typesetting mathematical formulas in LaTeX. Equations, aligning equations, arrays.	Student Talk 1 on Expository Paper.	Assignment 1: Mathematical Typesetting due 26 Aug 2015, 4:00 PM

Expository Paper project and presentations: Talk 1 on Expository Paper due 27 Aug 2015, 9:00 AM |
| 6 | 31 August - 6 September | Mini-talk 4. Mathematical writing. English usage and the LaTeX context. Theorems and friends, notation, words and symbols, dos and don'ts. Good Problems 4: Logical Connectives. Ch 3, 4 of Higham. | Annotations in bibliographies. Planning session for Expository Paper (sticky notes). | Exercises on bibliographies in LaTeX. Refine texfiles for Expository Paper according to plan made in tutorial. | Refine plans for your Expository Paper. Finalise draft Expository Paper for next week's discussion. | Expository Paper project and presentations: Draft of Expository Paper due 02 Sep 2015, 4:00 PM |

7	07 - 13 September	Mini-talk 5. English usage. When English is a foreign language. Good Problems 5: Graphs. Ch 4, 5.	Proof that the square root of 2 is irrational.	Type the proof from this week's tutorial. Set up a bibliography for your Expository Paper. Include an annotated item in your bibliography.	Students meet Course Coordinator individually to review draft of Expository Paper. 10 minutes.	Assignment 2: Cultural Awareness due 09 Sep 2015, 4:00 PM
8	14 - 20 September	Career planning. A selection from: job market, career options; knowledge, skills and attributes that employers seek; selection criteria; resume; cover letter; interview; self-marketing.	In computer lab. Clarify career direction; start gap analysis; start developing strategies; analyse job ads; draft resume; draft cover letter. Bring a previous resume.	Type your draft resume and cover letter for the Careers assignment. Or work on your Expository Paper.		
	21 - 27 September	Mid-break				
	28 September - 4 October	Mid-break				
9	05 - 11 October	Mini-talk 6. Writing a paper. Organisation, title, authors, abstract, introduction, citations, conclusions, acknowledgements, reference list. Good Problems 6: Introductions and Conclusions. Ch 6.	A geometric proof (volume of cube in cone), and a proof by induction (sum of first n positive integers).	Type the proofs from this week's tutorial.	Continue work on Expository Paper.	Labour Day 5/10/2015
10	12 - 18 October	Mini-talk 7. Revising a draft. Checklist for revision. Examples with prose. Examples with mathematical formulas. Ch 7.	Revise a draft article (Numerical Linear Algebra in the Sky). Time management: task list, time estimates, calendar.	Work on Expository Paper.		Assignment 3: Good Mathematical Writing due 14 Oct 2015, 4:00 PM

11	19 - 25 October	Mini-talk 8. Preparing and presenting a mathematics talk: designing a talk, writing slides, example slides. The Beamer documentclass for talk slides. Ch 10, 11.	Planning session for Talk 2 on your Expository Paper (sticky notes). Work on Expository Paper.	Set up Beamer texfiles for Talk 2 on Expository Paper topic. Work on Expository Paper and Talk 2.		Assignment 4: Career Planning due 21 Oct 2015, 4:00 PM
12	26 October - 1 November	Mini-talk 9. Project management. A selection from: Gantt charts; Program Evaluation and Review Technique (PERT); Critical Path Method; the Time Schedule.	Rehearse draft Talk 2, in pairs. Give and receive feedback on draft talk. Implement feedback.	Examples for project management. Project network. Critical path. Time schedule. Work on Talk 2.	Rehearse and finalise Talk 2. Review Week 1 advice on giving maths talks.	Expository Paper project and presentations: Final Expository Paper due 28 Oct 2015, 4:00 PM
13	02 - 8 November	Student 10-minute talks on Expository Paper topic.	Student 10-minute talks on Expository Paper topic.	Student 10-minute talks on Expository Paper topic.		Expository Paper project and presentations: Talk 2 on Expository Paper due 02 Nov 2015, 2:00 PM
	09 - 15 November	Swot-vac				
	16 - 22 November	Exam week				
	23 - 29 November	Exam week				