

Technical Writing with \LaTeX – Math 201 Course Syllabus – Spring 2019

INSTRUCTOR: Roger Griffiths	OFFICE HOURS:
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CLASS TIME: Tues, Thurs: 12:30 - 1:45,	Thur: 08:00 - 09:20 (in Hirt M209)
LOCATION: in Old Main Lab	Fri: 10:00 - 10:50
WEB: http://math.mercyhurst.edu/~griff/courses/math201/	
TEXT: <i>LaTeX in 24 Hours: A Practical Guide for Scientific Writing</i>	

COURSE DESCRIPTION:

This course provides students with an introduction to technical writing, complex graphics, and computer presentations with \LaTeX , which is the de-facto standard in computer science, mathematics and many of the sciences (and gaining traction in: economics, philosophy, and political science). The course offers techniques for writing documents (from single page letters to large complex book-like documents), preparing computer presentations, using and working with graphics in documents, and various techniques for creating complex graphics in an integrated manner.

The course has been designed for students with little/no programming experience, and minimum college level mathematics. Those of you with more mathematics experience will get more out of certain parts of the course.

The course will start out slowly, for the first two weeks, as we get used to the editing cycle, and issues with the software and editor. The pace will slowly pick up, so that by week seven, each of you will be expected to learn new \LaTeX packages and other features on your own. By the end of the class you will be completely self-sufficient working with \LaTeX .

REMARKS:

- \LaTeX - is a document markup language and document preparation system for the \TeX typesetting program. The term \LaTeX refers only to the language in which documents are written, not to the editor used to write those documents. In order to create a document in \LaTeX , a .tex file must be created using some form of text editor. Thus, in contrast to standard word processors, your document is a separate file that does not pretend to be a representation of the final typeset output, and so can be easily edited and manipulated.
- Why \LaTeX ? – \LaTeX is a high-quality open source typesetting language that produces professional output and PDF files. However, as \LaTeX is a powerful and complex tool, getting started can be intimidating. There is no official support and certain aspects such as layout modifications can initially seem rather complicated. It may seem more straightforward to use MS Word or other WYSIWG programs, but once you've become acquainted, \LaTeX 's capabilities far outweigh any initial difficulties. If you are writing mathematical or scientific papers then \LaTeX is the right tool for you.

- We will cover the several of the basic packages in depth and then survey a few of the more advanced packages used by seasoned \LaTeX users.
- The learning curve can be steep, but as the course progresses you will slowly gain a basic understanding of the markup language and the editing cycle. You will leave the course with the ability to continue learning this language on your own.
- Though writing \LaTeX looks like programming, don't be afraid. Soon you will know the frequently used commands.
- A basic principle of \LaTeX , and most markup languages, is the separation of the content from the presentational aspects. Here the author should not be distracted by formatting issues, simply concentrate on the content and the structure. Usually, the author focuses on the content and formats logically, for example, instead of writing a chapter title in big bold letters, you just tell \LaTeX that it's a chapter heading (that is part of the structure of the document).
- [Portability] \LaTeX is available for nearly every operating system, like Linux, Windows, Mac OS X, and many more. Its file format is plain text - readable and editable, on all operating systems. \LaTeX will produce the same output on all systems. \LaTeX generates PDF output, printable and readable, on most computers and looks identical regardless of the operating system. Besides PDF, it supports DVI, Postscript.
- Though there are different \LaTeX software packages, so called \TeX distributions, in this class we will use *\TeX Live*, because this distribution is available for Windows, Linux, and Mac OS X.
- \LaTeX comprises a collection of \TeX macros and a program to process \LaTeX documents; ie built on top of \TeX . \TeX is not new, it was released in 1978 (that predates both Mac and Windows by about a decade).

LEARNING OBJECTIVES:

By the end of this course, you will have acquired proficiency with \LaTeX , as well as many power features of \LaTeX which include, but are not limited to, the ability to:

1. Download and install a comprehensive \LaTeX distribution.
2. Create basic types of \LaTeX documents (article, report, letter, book).
3. Format words, lines, and paragraphs, design pages, create lists, tables, references, and figures in \LaTeX .
4. Typeset complicated mathematics: beginning with basic formulas (inline) and centered and numbered equations (display math) and aligning multi-line equations. In particular, you will learn how to typeset mathematical symbols such as roots, arrows, Greek letters, and a wide variety of mathematical operators. Furthermore, you will learn how to build complex math structures such as fractions, stacked expressions, and matrices.
5. Import graphics, as well as: building diagrams, enhancing figures, and plotting functions, using the graphics packages: `pstricks`, and `PGF/tikZ`.
6. Listing content and references: creating a table of contents and lists of figures and tables; as well as how to cite books, create bibliographies, and generate an index.
7. Develop large documents: create complex projects building upon sub-files.
8. Enhance your documents further: bring color into your documents, and learn how to create feature-rich PDF documents with bookmarks, hyperlinks, and meta-data.
9. Create professional presentations using \LaTeX ; using both the `beamer` and the `powerdot` packages.
10. By mid-term in the course you will have learned enough \LaTeX to become a self-learner and begin investigating and learning new \LaTeX packages on your own.

EVALUATION:

Your letter grade in this course will be based on:

- Homework 55%
- Midterm Exam 20%
- Final Exam 25%

And assigned according to the following scale:

Course %	100-90	89 - 87	86 - 80	79 - 77	76 - 70	69 - 60	< 60
Letter Grade	A	B+	B	C+	C	D	F

GRADING PARTICULARS:

- ✓ One mid-term exam; in-class and closed-book.
- ✓ A final exam; in-class, cumulative, and closed-book.
- ✓ Frequent homework assignments. Particulars:
 - Homework will be due as specified when the assignment is made, generally before the beginning of the second class after it was assigned. It is your responsibility to verify that you have uploaded the correct files (on time).
 - Generally homework will require submission of both the \LaTeX source (.tex) file and either the pdf or ps compiled version via The Math Moodle server.
 - Always start EARLY on homework assignments, nothing ever works on a computer when you are in a rush.
 - Moodle will impose a cut-off time for homework submissions, it is your responsibility to ensure assignments are uploaded in a timely fashion. Note, this means there are no late assignments. We will make sure everyone can get this done before the first assignment. You must have a verifiable, legitimate excuse to avoid a penalty for a late assignment.
 - No homework will be accepted via email.
 - There will be two in-class presentations.
 1. A short presentation on a \LaTeX package of your choice.
 2. A 15 - 20 minute final presentation on any (math, statistics, datascience, economics, computer science, natural science, or hobby) topic.
 - Please observe the remarks under Student Conduct below.

HOMEWORK:

Stay up to date with homework, I will make homework *suggestions* almost every class. All of these little pieces will eventually become an assignment with a due date. The material in this class is not conceptually challenging but will require a lot of time 'playing'. You should plan to spend approximately 6-10 hours per week, outside of the classroom, on homework and assignments for this course. Once you really start to work in this class, it is difficult to imagine you not finding this work **fun**. Like all mathematics courses, the homework is where all of the learning takes place, the time you spend on the homework is the key to your success in this class.

COURSE POLICIES:

- ✓ You must establish a *class contact* (see attendance below).
- ✓ A prerequisite for additional help outside the classroom is regular class attendance.
- ✓ Email is great for simple communications, but more complex issues are often handled better in person.
- ✓ Don't use email as an excuse to avoid personal contact.

ATTENDANCE:

Attendance is not required. However, you are responsible for all that is announced or covered in class even if you are absent. Use your *class contact* to obtain notes and get clarification on missed material.

A class contact is a classmate that you establish, ahead of time, as someone you get in touch with about any issues in the class.

STUDENT CONDUCT:

It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Thus, a student should not falsely claim the work of another as his/her own, or misrepresent him/herself so that the measures of his/her academic performance do not reflect his/her own work or personal knowledge. In this regard, cheating will not be tolerated. Cheating includes (but is not limited to) direct sharing of homework or any communication (written or oral) during examinations, see my page on [General Collaboration Guidelines](#). All homework and projects must be an individual effort unless specifically noted.

COMPUTERS:

Each student will be required to have access to a computer, preferably a laptop, on which all of the software mentioned above can be installed. Please let me know on, or before, the first day of class if you do not have such access. We will be utilizing this software in class most days, thus you are strongly encouraged to bring your laptop to class.

LEARNING DIFFERENCES:

In keeping with college policy, any student with a disability who needs academic accommodations must call the Learning Differences Program secretary at 824-3017, to arrange a confidential appointment with the director of the Learning Differences Program during the first week of classes.

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TENTATIVE COURSE CALENDAR

Jan	15	Introduction - Overview
	17	Introduction - Ch. 1
	22	Fonts Selection - Ch. 2
	24	Formatting Text I - Ch. 3
	29	Formatting Text I - Ch. 3
	31	Formatting Text II - Ch. 4
Feb	5	Page Layout and Style - Ch. 5
	7	Listing and Tabbing Text - Ch. 6
	12	Table Preparation I - Ch. 7
	14	Table Preparation II - Ch. 8
	19	Figure Insertion - Ch. 9
	21	Equation Writing I - Ch. 11
	26	Equation Writing II - Ch. 12
	28	Miscellaneous I - Ch. 17
	2-10	Mid Semester Break
	March	12
14		Presentations II - Ch. 22 - BEAMER
19		Illustrations - TikZ & PGFPLOTS
21		Exam I
26		Illustrations - TikZ
28		Miscellaneous II - Ch. 18
April		2
	4	In-Class Presentations - Packages
	9	More Tables
	11	User-Defined Macros - Ch. 13
	16	Bib \TeX - Ch. 15
	18	Easter Break - No Class
	23	More Mathematics
	25	Letter, Article, Book, and Report - Ch 20,21
	30	In-Class Presentations - Final Project
	May	2
7		Final Exam 1:00 - 3:00