



UNIVERSITY OF CALGARY

DEPARTMENT OF MATHEMATICS AND STATISTICS COURSE OUTLINE

1. **Course:** PMAT 527/627, Computational Number Theory

L01: MWF, 12:00-12:50, MS 452 Mark Bauer, MS 458 220-6628, bauerm@ucalgary.ca, Office Hours: M 13:00-14:00 W 14:00-15:00

D2L: **PMAT 527/ 627 L01 - (Fall 2014) - Computational Number Theory**

2. **Prerequisites:** PMAT 427 or 429. <http://www.ucalgary.ca/pubs/calendar/current/pure-mathematics.html#30284>

3. **Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Assignments (8)	40%
Midterm test	20% (Monday, Oct. 20)
Final Project	40%

Letter Grade Conversions	
Letter Grade	% range
A+	>95
A	90–94.5
A-	86–89.5
B+	82–85.5
B	78–81.5
B-	74–77.5
C+	70–73.5
C	66–69.5
C-	62–65.5
D+	58–61.5
D	50–57.5
F	<50

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in Section 3.6. It is the student's responsibility to familiarize himself/herself with these regulations. See also Section E.6 of the University Calendar

5. **Course Materials:** V. Shoup. *A computation introduction to number theory and algebra*, 2nd Edition, Shoup, Victor. Cambridge University Press, 2009.

R. Crandall and C. Pomerance. *Prime Numbers: A Computational Perspective*. Springer-Verlag, 2006.

Online Course Components: We will be using SAGE to handle the programming part of this course. It is available freely online either from the SAGE math cloud server or by downloading and installing on your computer. Full Details can be found on d2l.

6. Examination Policy: No electronic aids will be allowed during the midterm. 1 page of handwritten notes will be allowed. Students should also read the Calendar, Section G, on Examinations.

7. Final Project: Students have two options for the format of the final project.

1) A coding project consisting of:

- a) the implementation of a number theoretic algorithm or structure;
- b) a short paper describing the mathematical background for the algorithm and interesting choices made in the implementation;
- c) a presentation in class describing and demonstrating your code and the underlying mathematics.

2) An expository project consisting of:

- a) a longer essay describing an area of computational number theory not covered in the course, or exploring in more detail one of the topics touched upon in the lectures;
- b) a presentation in class, either providing a broad summary of the mathematics described in the essay or giving a more focused description of one algorithm studied.

8. OTHER IMPORTANT INFORMATION FOR STUDENTS:

(a) Academic Misconduct: (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K. Student Misconduct to inform yourself of definitions, processes and penalties

(b) Assembly Points: In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points.

(c) Academic Accommodation Policy: Students with documentable disabilities are referred to the following links: Calendar entry on students with disabilities and Student Accessibility Services.

(d) Safewalk: Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

(e) Freedom of Information and Privacy: This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also

(f) <http://www.ucalgary.ca/secretariat/privacy>.

(g) Student Union Information: VP Academic Phone: 220-3911 Email: suvpaca@ucalgary.ca.
SU Faculty Rep. Phone: 220-3913 Email: sciencerep@su.ucalgary.ca; Student Ombudsman

(h) Internet and Electronic Device Information: You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

(i) At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.