p-adic Hodge Theory, MATH 726 Fall 2008

Burnside Hall 1120, MF 10:30-12:00

Instructor: Bryden Cais   **Office:** 1126 Burnside Hall

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Course Topics: p-adic Galois representations, theory of Hodge-Tate representations and Tate-Sen theory, étale φ-modules (for Galois groups of characteristic p fields) with p-power torsion and $\mathbf{Z}_p$-coefficients, p-adic period rings (their construction and properties) and the formalism of p-adic representations, de Rham, crystalline and semistable representations, filtered (φ, N)-modules.

Text: Throughout the course, we will follow Brian Conrad's notes "Bilgi Lectures on p-adic Hodge theory," available here:

http://math.stanford.edu/~conrad/papers/notes.pdf

We will supplement these occasionally with other notes and resources that will be linked from the course web-page.

Webpage: A course webpage will be maintained here:

http://www.math.mcgill.ca/bcais/726Page/index.html

Assignments and links to other resources will be posted there.

Method of Evaluation: Assignments: 100%

Homework: There will be regular assignments, approximately one every week and a half. The due dates will be flexible.

Important Dates: Note that Monday, October 13 is a Holiday. We will make up that class the week of December 2–6.

References: Please see:

http://www.math.mcgill.ca/bcais/726Page/references.html

Tentative Schedule (Section numbers refer to Conrad's Bilgi notes)

Friday	9-5	Introduction and 1.1–1.3
Monday	9-8	2.1–2.2
Friday	9-12	2.3
Monday	9-15	3.1
Friday	9-19	3.2
Monday	9-22	3.2–3.3
Friday	9-26	4.1–4.2
Monday	9-29	4.2–4.3
Friday	10-3	4.4
Monday	10-6	4.4
Friday	10-10	Buffer; complete chap 4 by this time.
Monday	10-13	Thanksgiving Break
Friday	10-17	5.1–5.2
Monday	10-20	5.2
Friday	10-24	6.1–6.2
Monday	10-27	6.3
Friday	10-31	7.1–7.2
Monday	11-3	7.2
Friday	11-7	7.3
Monday	11-10	7.4
Friday	11-14	7.4
Monday	11-17	8.1
Friday	11-21	8.1–8.2
Monday	11-24	8.2
Friday	11-28	8.3
Monday	12-1	8.3
Tuesday	12-2	Buffer