Graduate-student orientation

Combinatorics & Optimization
Fall 2016
People

- Melissa Cambridge (MC 5116): Graduate Coordinator
- Chaitanya Swamy (MC 5118): Associate Chair for Graduate Studies
- Jessica Won (MC 5103): Assistant to the Chair
- Jochen Konemann (MC 5106): Chair
Your first term at UW

• Taking courses
• Getting started on research
• Working as a Teaching Assistant (TA)
• Research Skills seminar
• Other department/faculty seminars
• Applying for external scholarships
• Social events
Courses

• How many courses should I take in the Fall term?
  3 (or 2)  
  **CONSULT YOUR ADVISOR**

• When should I register for my courses?
  In the first week of classes

• Which courses should I take?
Choosing your courses

Take into account:

• Your background and interests
• Your course requirements
• For Ph.D students, which comprehensive exams you plan to take

Plan ahead! And **CONSULT YOUR ADVISOR**
Planning ahead

Not all C&O courses are offered every year, but **core** C&O courses are.

**Four** out of **six** C&O **core** courses offered this term:
- CO 642: Graph theory
- CO 650: Combinatorial optimization
- CO 681: Quantum information processing
- CO 685: Public-key cryptography
ALSO offered this term:

- CO 602: Fundamentals of optimization
- CO 666: Continuous optimization
- CO 749: Topics in graph theory (Jim Geelen)
Courses in upcoming terms

Winter 2017:

• CO 630: Algebraic enumeration
• CO 663: Convex optimization and analysis
• CO 652: Integer programming
• CO 644: Algebraic graph theory
• CO 749: Topics in graph theory (P. Haxell)
• CO 750: Topics in combinatorial optimization (L. Sanita)
• CO 769: Topics in continuous optimization (L. Tuncel)
• CO 781: Topics in quantum information (A. Nayak)
# Courses in upcoming terms

**Winter 2017:**

- **CO 630**: Algebraic enumeration
- **CO 663**: Convex optimization and analysis
- **CO 652**: Integer programming
- **CO 644**: Algebraic graph theory
- **CO 749**: Topics in graph theory (P. Haxell)
- **CO 750**: Topics in combinatorial optimization (L. Sanita)
- **CO 769**: Topics in continuous optimization (L. Tuncel)
- **CO 781**: Topics in quantum information (A. Nayak)
SPRING 2017 (tentative):

- CO 671: Semidefinite optimization
- CO 749: Topics in graph theory

Courses NOT offered this academic year (i.e. in F16, W17, S17) include: CO 646 (Matroid theory), CO 664 (Quadratic programming), CO 687 (Applied cryptography)
C&O course requirements

• Masters (thesis option):
  2 **CORE** C&O courses + 1 other C&O course
  + 1 other course

• Masters (research paper option):
  3 **CORE** C&O courses + 1 other C&O course
  + 3 other courses

• Ph.D: 4 **CORE** C&O courses + 1 other C&O course
  + 3 other courses
Comprehensive exams

Ph.D students need to write **ONE** comprehensive exam each from **TWO** of the following categories:

- Combinatorial enumeration, Graph theory
- Discrete optimization, Continuous optimization
- Quantum computing, Cryptography

The exams are held each summer (**June/July**). They must be taken within 4 terms of starting the Ph.D program.
Closely associated with these exams are the C&O Core courses:

- Combinatorial enumeration: CO 630
- Graph theory: CO 642
- Discrete optimization: CO 650
- Continuous optimization: CO 663
- Quantum computing: CO 681
- Cryptography: CO 685
Research

Your research project will be chosen by you and your advisor.

Meet with your advisor **Regularly** and **Frequently**!
Teaching Assistantship (TAship)

Your Teaching Assistantship is not “just” a job.

It’s an important part of your training and academic experience.

We expect you to do a **GOOD** job, not just an **OK** job.

Workload is **5 hours per week (ON AVERAGE)** from **Sep 1 – Dec 31**.
TA duties may include:

- Grading assignments and exams
- Holding office hours for individual student help
- Proctoring exams for your assigned course
- Teaching tutorial sessions
- Math Tutorial Center
- Coordinating and supervising undergraduate markers
- Pool proctoring of other exams in the Math faculty
Interactions with students

- **Know the Material**
- **Give Hints** instead of telling students the solution
- **Encourage** students to discover solutions themselves
- **Be Punctual**
- **Include Comments** and indicate specific errors and when grading
- **Be Consistent** in grading
Research skills seminar
(also called Grad seminar)

• **Required** for all new Masters and Ph.D students
• Coordinated by Dave Wagner
• **Tuesdays at 3pm in MC 6486**
Other seminars

• **Tutte Colloquium**: Fridays 3:30pm. The regular seminar of the C&O department – should plan to attend.

• **Faculty of Math seminars**: occasional. Distinguished invited speakers.

• **Seminars in your area**.

Seminars for the coming week are announced the preceding Friday in an email from the Math faculty.

Seminars are also listed at: [https://www.math.uwaterloo.ca/~wnotice/notice_prgms/wreg/view_notice.pl](https://www.math.uwaterloo.ca/~wnotice/notice_prgms/wreg/view_notice.pl)
External scholarships

- NSERC (Government of Canada): for Canadian citizens and Permanent Residents
- OGS (Ontario Government): open to all
- Melissa will forward application details when they become available
Social events

• Welcome Lunch for new graduate students: Wednesday, Sep 14 at noon in MC 5501

• C&O cookie time: Tuesdays, Fridays at 3pm in the C&O lounge

• C&O potluck dinner: Winter term (details: TBA)

• C&O picnic: Spring term (details: TBA)
Problems?

Who may be able to help?

• Graduate coordinator (Melissa Cambridge: MC 5116)
• Your advisor
• Your fellow graduate students:
  – Jason LeGrow (MC 5481) is the grad-student representative: common issues can be brought to his attention
  – Leanne Stuive (MC 5481) is the MFCF computing rep.
• Graduate chair (Chaitanya Swamy: MC 5118)
• University services (Counseling services, International student experience team, Ombudsman etc.)
Have a great time!