

## Course Outline

### NATS 1920 A 6.00

## THE NATURE AND GROWTH OF IDEAS IN MATHEMATICS

Fall-Winter 2018-2019

Monday, 14:30-17:30, York Campus, Classroom SLH A

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#### Course Director, office hour, and contact

- **Course Director: Daniela Monaldi**
  - **Office hour: Monday, 13:10-14:10**
  - **Office: Norman Bethune College, room 308**
  - **Telephone: 416 736 2100 ext. 33601**
    - **At office hour, you may come by or call without appointment**
  - **Email: [dmonaldi@yorku.ca](mailto:dmonaldi@yorku.ca)**

#### Email policy and etiquette

- I will normally respond to emails in 24-48 hours

- Send me your emails from your yorku.ca or my.yorku.ca accounts, as messages from other providers (hotmail, gmail, yahoo, etc.) often get caught and removed by the spam filter of the yorku server
- Before sending an email, read this Course Outline and the other information posted in the course website, including the Course Announcements forum. Most of the questions that students ask in their emails are already answered here or in the course website. If you do not find an answer, then feel free to email me your question
- Please, take care to compose a proper email
  - write the course number and a brief indication of the email content (*e.g.*, “NATS1920, Question on Topic X”) in the subject line. In any case, do not leave the subject line empty
  - start the email with a greeting, as for example “Dear Dr. Monaldi”, and close it with a salutation, as for example, “Sincerely” or “Best regards”, followed by your signature
  - include your name, student number, and the course you are in
    - you may include this information in the body of the email, use it as your signature, or add it after your signature
    - write your full name as it appears in the class list, especially if you use a short form or another name as your signature, and even if it appears in the sender line
  - if you are writing a reply or the continuation of an existing exchange, you may omit your name and student number, but keep the subject line unchanged, and leave the copy of the previous emails in for reference
  - write in clear and complete sentences. Proofread what you write, please

### **Expanded course description**

This course explores some of the most important ideas, techniques, and theorems in the history of mathematics and their impact in society. The objective is to understand the role of mathematics in our culture and technology. The topics include the origins and uses of counting and number systems; mathematical practices in earlier civilizations; the emergence of mathematics as theory and the notion of proof; the evolution of geometry, especially Euclid’s work, its long-lasting influence, and the departures from it; the use of mathematical models to grapple with the mysteries of the heavens and laws of nature; how mathematics became the language of modern science and engineering, and a motor of modernity; the growth of the quantifying spirit in the industrial world; the rise of statistics and the theory of probability; the history of automatic computation and the dawn of the digital age; and the expanding reach of mathematical thinking to traditionally non-mathematical fields in the twentieth century.

This is not a mathematics course. Rather than focusing on the technical content of theorems and equations, we aim to build an understanding of how mathematics relates to the broader social and cultural context in which we live. No training in mathematics beyond high-school level is required. All that is needed is openness to learning and to engaging actively with mathematical ideas.

### **Learning outcomes**

Upon successfully completing this course, you will be able to

- identify and describe some of the major development and leading characters in the history of western mathematics
- explain the historical significance those developments and characters
- discuss the current relevance of the changes initiated by those events
- sharpen and practice reading and listening comprehension skills, such as identifying the main points of a lecture or reading, expressing them in your own words, and connecting them to related issues in other lectures and readings

### **Evaluation**

The course grade (Course Total) will be determined according to the following scheme:

- Test 1, in class, 6 Nov 2017, on the topics of weeks 1-7, worth 25%
  - 3 short-answer questions (5% each) and one long-answer question (10%)
- Test 2, in class, 29 Jan 2018, on the topics of weeks 9-15, worth 25%
  - 3 short-answer questions (5% each) and one long-answer question (10%)
- Test 3, in class, 2 Apr 2018, on the topics of weeks 17-23, worth 20%
  - 40 multiple-choice questions (0.5% each)
- 6 Quizzes, discussed in class and submitted online, worth 30% (6% each, best 5 grades)
  - Questions of various kinds on the current topics. The quizzes will be presented and discussed in class on Sept 25, Oct 30, Nov 27, Jan 15, Feb 12, and Mar 12. The answers will be due online a few days later. The lowest quiz grade will be discarded.

Full compliance with the York University policy of academic integrity is expected. For more information and links about academic integrity, see the section on university policies below.

Every test and quiz will be graded according to its grading weight: Test 1 and Test 2 will be graded out of 25 (in other terms, the grade range for Test 1 is 0-25, *i.e.*, the maximum grade is 25), Test 3 out of 20, and each of the quizzes out of 6.

For every test and quiz, your grade will be posted in your Grades table of the course website soon after the grading is completed. You can access your Grades table from the Navigation panel in the course website.

During the course, the number displayed in the Course Total line will be the sum of all the grade quizzes and tests already marked. To know your standing at any point in the course, divide the displayed Course Total by the sum of the ranges of the tests and quizzes that have been marked at that point. After the grading of Quiz 6, your lowest quiz grade will be discarded to calculate the Final Grade.

Your complete grade for the course will be the Course Total displayed at the end of the course, after the grading of all the quizzes and tests, minus your lowest quiz grade. The grade on your official transcript will be a letter grade (A+, A, B+, B, C+, etc.) assigned converting the Final Grade to a letter grade according to the [York University Grading Scale](#).

For consistency and fairness, all the students in the class must be graded according to the same grading scheme. No artificial grade increase or “extra assignment” will be provided for any reason at any point during or after the course. If you are having difficulties completing a quiz or attending a test, contact me for assistance as soon as possible, before you receive the grade for the assignment. Please, contact me about an already assigned grade **if and only if** there is an error in the calculation or recording of a grade, or if you wish to request a reappraisal (for the policy on reappraisals, see below), and do so within two weeks from the assignment of the grade.

### **Course materials**

- Course Outline (this document)
- Course Schedule, posted in the course website. It contains all the information about dates, topics, quizzes, and tests, and required readings
- Course manual: D. M., *The Nature and Growth of Ideas in Mathematics*. Second Edition (Dubuque, IA: Kendall Hunt, 2014). Available in print format at the York University Bookstore and in [ebook format \(electronic delivery, 365 days\) from the publisher](#)
- Jon Agar, *Turing and the Universal Machine. The Making of the Modern Computer* (Cambridge, UK: Icon Books, 2001). [The 2017 reprint of this book is available to preorder with free delivery from Book Depository](#)
- Other texts (lecture notes, articles, excerpts from books, or web documents), which will be posted in the course website

### **Course content and format**

The course consists of in-class lectures and activities, reading assignments, quizzes, and tests. These components complement each other and all are indispensable to your success. Plan to attend classes regularly and to follow the Course Schedule.

The dates, topics, and reading assignments are detailed in the Course Schedule, which will be posted in the course website. You are expected to complete the reading assignments before the class for which they are assigned, and to be ready to ask and answer questions about them.

The dates of quizzes and tests are also listed in the Course Schedule. Be sure to note them and make plans not to miss any quiz or test.

### **Math content**

The entire course is about mathematics, but students are not expected to be proficient in mathematics beyond about a Grade 10 level. More familiarity will probably be helpful, though not mandatory.

### **Course policies**

- Conduct during the tests
  - The only items allowed on your desk during a test are the test paper, your pencil, and an eraser
  - All electronic devices must be turned off and placed under your desk, in your closed bag or knapsack
  - The Tests will take place during class time. They will start at the start of the class, at 14:30. No student will be admitted to the test after 14:45
  - Check the dates of the Tests in the Course Schedule carefully, and plan your time to ensure that you will attend them
- Missed tests
  - If you happen to miss a test for a cause that is beyond your control, such as an illness or an emergency, notify me as soon as possible and no later than 48 hours from the test, and be prepared to justify your absence in a timely manner with adequate documentation
  - In case of an illness, the required document is an [Attending Physician Statement \(APS\)](#), filled and signed by a medical doctor who sees you during your illness, and handed to me within two weeks from the test. The APS form is available from the [Student Forms page](#) of the [Registrar's Office website](#). The link is also provided in the course website
    - A note written by a doctor or nurse who states that you told them that you were ill does not constitute adequate documentation
  - For all other cases, "adequate documentation" means a document that provides evidence of your justification. There can be no exception to this rule. If, for example, you miss a test because you must attend a funeral, whether in Canada

- or abroad, you must ask the funeral director to write a letter to testify that you attended the funeral
- Vacations of any kind do not justify missing a test. Do not plan a vacation for the test dates
  - Employment conflicts do not justify missing a test. If you have a job, ensure that your work commitments do not interfere with the course
  - If you miss a test and are unable to justify your absence or do not provide adequate documentation within a reasonable time, you will receive a grade of zero for the test
  - Students who will send me prompt notice of their absence to a test and will provide adequate documentation will be admitted to a test makeup. The test makeup will be in the same format as the regular test and will cover the same material. The date and time of the makeup will be communicated to the admitted students after the regular test, and are not negotiable
- Late or missing quiz answers
    - Late quiz answers will be penalized at the rate of 1% per day
    - There will be no makeup for missed quizzes. If you miss one quiz, your course total and final grade will not be affected because the lowest quiz grade will be discarded. If you miss more than one quiz, you will lose the corresponding grades. Exceptions can be made only in some special, well justified and well documented cases, which must be notified to me before or soon after the missed quizzes
  - Reappraisals: if you wish to request the reappraisal of a test or quiz, email me your request and a rationale
    - the reappraisal must be requested within two weeks after the grade has been posted
    - the rationale must be based on the academic merit of the test or quiz
      - Examples of rationales based on academic merit are, “My answer satisfies the grading criteria *a*, *b*, and *c*”, and “My answer is correct according to the required reading *X*, page *yz*”
      - Reasons such as “I worked really hard”, “This grade lowers my GPA”, and “I really really need a higher grade” do not qualify as academic merit
    - please, be aware that a reappraisal may result in the same grade, a higher grade, or a lower grade, depending on the case
  - Staying informed: it is your responsibility to stay informed about the course by participating in class, reading the course announcements, and visiting the course website at least once a week
  - Course Announcements: general information relevant to all the students in the class will be posted through the Course Announcements forum. You will receive the course

announcements at the email account you provided at the time of registration, and will be able to view them in the forum

- Posting grades: your grades will be posted in your Grades table, which you can access from the Navigation panel in the course website. For every test and quiz, the grade will be posted soon after the grading is completed
- Adversities and disabilities:
  - if an adverse factor, such as a disability, a protracted illness, or some personal hardship, interferes with your ability to participate in the course or to prepare for a test or quiz, contact me as soon as possible to discuss possible accommodations. I will not take into consideration adversities that will be notified to me only after a mark was assigned
  - for disabilities, see also the section on university policies below
- Religious accommodations: see the section on university policies below

### **Copyright and intellectual property**

- Recording lectures and photographing slides is permitted exclusively for personal use
- Uploading or posting any part of the lectures, slides, assignments, or other course material (other than online content that is already in the public domain) is a violation of intellectual property rights; therefore, it is not permitted.

### **University policies**

#### **University Policies**

##### **Important Sessional Dates**

For the sessional start and end dates, drop deadlines, and withdrawal dates, consult the Office of the Registrar website at <http://www.registrar.yorku.ca/enrol/dates/>

##### **Academic Honesty and Integrity**

Academic honesty requires that persons do not falsely claim credit for the ideas, writing or other intellectual property of others, either by presenting such works as their own or through impersonation. Similarly, academic honesty requires that persons do not cheat (attempt to gain an improper advantage in an academic evaluation), nor attempt or actually alter, suppress, falsify or fabricate any research data or results, official academic record, application or document. Finally, academic honesty requires that persons do not aid or abet others to commit an offence of academic dishonesty, including intentional acts to disrupt academic activities.

Suspected breaches of academic honesty will be investigated and charges shall be laid if reasonable and probable grounds exist.

##### **Academic Honesty and electronic devices during assessments (e.g. exams)**

- Internet capable and personal storage devices of all kinds must be turned off, including vibrate. These and any other unauthorized material must be placed under the student's chair and should not be accessed at any point during the exam. Failure to comply with directive may be considered a break of academic honesty.
- See <http://registrar.yorku.ca/exams/tipsheet>

Please familiarize yourself with the full Senate Policy on Academic Honesty, found at <http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>

Please also familiarize yourself with the SPARK Academic Honesty tutorial found at <https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>

### **Academic Accommodation for Students with Disabilities**

York University shall make reasonable and appropriate accommodations and adaptations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs.

The nature and extent of accommodations shall be consistent with and supportive of the integrity of the curriculum and of the academic standards of programs or courses.

Please familiarize yourself with the full Senate Policy on Academic Accommodations for Students with Disabilities, found at <http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/>

**Note: Students should submit accommodation letters from Counseling and Disability Services (CDS) to the course instructor within the first two weeks of the course or as soon as issued.**

Counseling and Disability Services - <http://cds.info.yorku.ca/>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

**Note: A student registered with CDS, and choosing to write with Alternate Exams, is responsible for making the appropriate writing arrangements within the timeframes outlined by Alternate Exams.**

Alternate Exams - <http://altexams.students.yorku.ca/>

### **Religious Observance Accommodation**

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents.

<https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/15/wo/kmHGekTpzKLX6XYKBXYc8M/0.3.4.62.0>

**Note: Students who will have an academic conflict as a result of a religious observance, at any point in the term, should make the instructor aware of such at least three weeks prior to the conflict.**

For conflicts occurring during an official examination period, please complete the Examination Accommodation Form available at [http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf) and submit to your instructor at least three weeks prior to the final exam.

### **Student Conduct in Academic Situations**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect and to refrain from actions disruptive to such a relationship. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. A statement of the policy and procedures regarding disruptive and/or harassing behaviour by students in academic situations is available on the website of the University Secretariat (<http://secretariat.info.yorku.ca/>).

## **Division of Natural Science resources**

**Division of Natural Science Resources**



**NATS-AID**

Free peer tutoring for students enrolled in Natural Science Courses.

See <http://natsci.info.yorku.ca/nats-aid/>

**M-AID in NATS (Math Aid)**

Free math help for students enrolled in Natural Science Courses (TA tutors)

See <http://natsci.info.yorku.ca/m-aid-in-nats/>

**Other resources****Other Resources****Learning Commons**

The Learning Commons brings together key supports for your learning: writing, research, learning skills and career services. <http://www.library.yorku.ca/cms/learning-commons/>

**goSAFE**

goSAFE is a complimentary service provided to the York Community. At the Keele campus, goSAFE has two routes: North Route & South Route which will safely transport community members by vehicle from one specified hub to another on campus. goSAFE operates seven days a week, all year round, including University closures (with the exception at Glendon during the Christmas holiday closure).

Call the goSAFE office at 416-736-5454 or extension 55454 during hours of operation. Please give your name, location and destination. <http://www.yorku.ca/goSAFE/>

**Mental Health and Wellness at York University**

Outlines a variety of resources available to support mental health and wellness

<http://mhw.info.yorku.ca/resources/resources-at-york/students/>

**Good2Talk**

Post-Secondary Student 24 hour Helpline

<http://www.good2talk.ca/> 1-866-925-5454