

Division of Natural Science

<http://natsci.info.yorku.ca/>

Course Outline

NATS 1870 B, Understanding Colour
Summer, 2018, **Double Speed** 6.0 Credit Offering
T, R, 1:00 p.m. – 4:00 p.m., Lassonde A (LAS A)

Course Instructor(s) and Contact Information

- **Professor:** **Dr. Jerusha Lederman**
 - Email: Lederman@yorku.ca
 - Course materials (notes, recorded lectures, etc.) posted on Moodle.
- **Office:** 1029 Victor Dahdaleh Bldg. (DB)
(within the Teaching Commons office area at 1050 DB, phone: 416-736-2100, ext. 88770)
- **Office hours:** by appointment, please email in advance to arrange.

Email Policies and Etiquette

- To ensure your messages are answered promptly, when emailing me, please make sure:
 - “NATS 1870” is ALWAYS included somewhere in your SUBJECT LINE.
 - Emails are sent from your official YU address, i.e. @my.yorku.ca. Other domains like yahoo, gmail, etc. may be flagged as spam and may not reach me.
 - I will always endeavour to reply to emails promptly but please allow up to 48 hours for a response before resending or emailing multiple times.



Expanded Course Description

Welcome to NATS 1870.06 B, “Understanding Colour”. This course will take a cross-disciplinary approach toward examining colour, with the aim of understanding colour and colour phenomena from the multiple viewpoints of art, physics, chemistry, physiology and history. No prior background in art or science is assumed. Mathematics will be limited.

IMPORTANT: Please note, this is a **double speed** course offering. This means that material usually covered over the course of a full academic year is condensed into one academic term with the full credit value earned by taking this course being 6.0 vs. 3.0 credits. Consequently, every week we have 2 lecture sessions of 3 hours in duration each, totalling 6 HOURS of class per week.

The online section of this course, NATS 1870 A, has been cancelled due to issues with the ongoing labour dispute. This is the only section of the course being offered this summer. It is officially an in-class offering, however, there will be no participatory component or attendance component associated with your mark. While it is preferable to attend lectures for your own comprehension, this is not a strict requirement. It is understood that many students will have work or other circumstances that prohibit them from physically coming to campus. Consequently, all lectures will be recorded and made available online via Moodle shortly after they occur.

Course Learning Outcomes

Upon successful completion of this course students should be able to:

- realize why colour is a perceptual product of the eye and mind and not an inherent quality of an object
- recognize the importance of Newton's "Experimentum Crucis" and how it changed our understanding of the fundamental natures of light and colour
- describe the microscopic processes whereby atoms absorb and emit light, and give rise to various colour phenomena
- explain how colour perception occurs, and why perception can be anomalous in some people
- experience adaptive processes which impact and change our perception of colour
- demonstrate the difference between additive and subtractive mixing processes
- describe how colour systems have been organized from a historical perspective recognize how the historical quest for new colour drove the alchemical roots of chemistry to its foundations as an applied science
- recognize how external colour changes can signal the occurrence of chemical reactions, and describe the underlying chemical processes at work (e.g. in pH reactions and in oxidation and reduction)
- describe how dyes and pigments differ in how they give colour to substances
- explore how dyeing fabric in different conditions impacts the final fabric colour and describe the underlying chemical processes at work (eg. in pH reactions and in reduction / oxidation reactions)
- compare how various microscopic phenomena give colour to minerals and gemstones
- recognize how structural colour gives colour to various natural phenomena like rainbows, sky colour, soap bubbles, animal and bird coloration
- observe colour phenomena in our daily lives and reflect on how the colour is generated and perceived
- appreciate science as a fundamental part of our everyday lives

Evaluation

Course Component	Weighting (% of Final Grade)
Online Assignment	12%
Test 1	25%
Test 2	25%
Final Exam	38%

In order to be fair and consistent to the entire class, individual grades are not negotiable and “extra credit” assignments are not provided at any point during or after the course.

- Please contact the instructor about a grade only if there is a clear error (calculation, clerical, etc.) within two weeks of the grade being made available to you.
- All grades will be posted on Moodle as soon as they are available.
- Please notify the Professor immediately if there is a discrepancy in any grade.

Course Materials

- There is NO textbook required for this course.
- Required readings will be posted as links to websites or ebooks available in the YorkU Library system.
- Links for course ebooks available under “Course Reserves” on the top moodle module

iClicker and In-Class Interaction / Participation:

NO PARTICIPATION COMPONENT FOR MARKS in NATS 1870 B.

As of the 2017/18 academic year, York has formally introduced the use of a new software system, iClicker, for the first time across the University. iClicker enables students to use their personal **mobile devices**, i.e. cell phones, laptops and tablets, as clickers. To enhance their own comprehension of the material, students will be asked to respond to questions using their **iClicker enabled mobile device** during the lecture periods. Normally, responding to these questions contributes to a 5% participation mark. **THIS IS NOT THE CASE** for this Summer’s NATS 1870 B offering. Although questions will be asked to students to improve engagement, **THERE IS NO PARTICIPATION / ATTENDANCE MARK** for NATS 1870 B. It is recommended, however, that students practice for test and exam style multiple choice questions by testing their knowledge through the iClicker questions posed in class and available subsequently in recordings. More details will be available on the Moodle course webpage and in discussion at our first class. For students who wish to participate but do not have a mobile device, please contact the Professor.

Students are encouraged to view the following video as an introduction to iClicker

(formerly called 'REEF')

<https://youtu.be/PFwF5jMi6H0>

Laboratory/Tutorial

This course does not have a laboratory or tutorial component

Course Content and Format

All course material can be found on Moodle.

Lecture notes, covering the main course content, will be made available as .pdf files in Moodle. All attempts will be made to post these lecture notes in advance of each class (up to 1 day), so that students are able to bring them to lectures to supplement with their own commentary. It may not, however, always be possible to post the notes in advance and some lecture notes may not get posted until just shortly after the class. Please stay patient. These lecture notes are carefully designed and created . They will all be made available for you within a reasonable timeframe to enable comprehensive studying, along with full recordings of each class.

Please also note that small changes and/or corrections may be made to the lecture notes following class presentation – make sure to check in with Moodle to download the most up-to-date version.

Materials posted on Moodle on a week by week basis and will include:

- An audio-visual recording of each lecture session (slides included)
- pdfs of lecture slides covered in class
- links to required readings, videos and websites of interest, as appropriate
- links to course reserve ebooks are posted under “Course Reserves” in the moodle module at the top left of your screen

IMPORTANT: I will frequently make important course announcements and reminders using Moodle’s announcement system. This will send individual emails to all students formally registered in the course. An example of what kind of information you can expect to receive in your email from me includes:

- notification of the posting of new course materials on Moodle
- notification of the posting of marks on Moodle
- date and time announcements for scheduling of exams and tests
- submission reminders approaching assignment due dates

To ensure you don't miss important course info, PLEASE CHECK YOUR EMAIL REGULARLY.

Math Content

- This course emphasizes the physical and conceptual bases of important equations (like the relation between wavelength and frequency)
- Simple calculations (with basic arithmetic, exponents and basic geometry) may be discussed and demonstrated in class.
- Any calculations you are asked to do in class or for assignments will be thoroughly explained and illustrated in the most simple, basic terms. Consequently, a background in math above the grade 10 level is not required.
- Students should be familiar with scientific notation, however, this will be reviewed prior to being used in the course.
- Graphs commonly used by scientists, including reflectance spectra are discussed and will be used to enhance understanding of core course concepts.
- There will be NO calculations on tests and exams.

About Test and Exam formats

All test and exams are **multiple choice**.

Course Policies

Questions and Concerns

Please direct all inquiries and comments to the Professor by email:

Lederman@yorku.ca

- when emailing, put "NATS 1870 B" in the header (so I know it isn't spam)
- include your full name and student number in the email

iClicker Policies – using your mobile devices in-class

PLEASE NOTE: It is optional for students to make use of their personal mobile device (laptop, phone or tablet) as a clicker to respond to entertaining and interactive, in-class multiple choice style questions.

Laptops, tablets and phones can be used beneficially by students during lectures to help facilitate note-taking and the use of other course tools like Moodle. However, when these devices are used in-class for other purposes like chatting in live messengers, emailing, shopping online and watching movies, this can be extremely disruptive to effective learning by yourself and others around you. Please be cognizant and respectful of others in your technological behaviours.

When using mobile devices, always ensure that:

- usage of mobile devices in the classroom is for course purposes.

- You should use your own iClicker student account and associated mobile device.

Assignment Policies

- This section of NATS 1870 B will require you to complete one, online assignment to be submitted and graded through entirely through moodle.
- Where applicable, proper references and citations must be given in all assignments. For information on style guides, see <http://www.yorku.ca/caitlin/wstudies/style.htm>
- Please familiarize yourself with the Academic Honesty Policy at: <http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>
- Note that plagiarism of any sort (direct copying of websites, presenting another's material as your own) is not tolerated and will be dealt with according to York University's Senate Policy (see link in "University Policies" section below on Academic Integrity)
- Penalties for academic misconduct can range from 0 for an assignment, to expulsion from the University in the case of a second offense.
- LATE ASSIGNMENTS NOT ACCEPTED

Exam Policies

- All students must show valid student card during exams.
- Dictionaries, cell phones and other electronic items are not allowed in exams. (Cell phones must be turned off and stored in students' bags during exams.)
- Only pens, pencils, erasers and a student card are permitted on the desk during an exam.

Policy for Missed Exams

- If due to illness or unforeseen emergency, a student must miss a scheduled exam, the Professor (lederman@yorku.ca) must be notified by the day the exam is to be written in order to arrange a make-up.
- If sufficient notice is not given, the student will receive a mark of 0 for the test.
- If exam is missed due to illness, please use the York University Attending Physician's statement form. A link is provided for you on the course MOODLE page.

Re-Grading Policy

There are no TAs for this course.

- Work may be re-submitted for consideration to the Professor, provided a student has a clear reason for the request (not just an attempt at extra marks).
- The Professor may re-grade the entire test or assignment, and the overall grade may go UP or DOWN accordingly.

Student Conduct

Both in-class and online, students are required to maintain courteous and respectful communication with all members of our course at all times.

Please see the University's Student Code of Conduct at

<http://oscr.students.yorku.ca/csrr/standards>

Copyright and Intellectual Property

COPYRIGHT LAWS:

Most of the material shown in the lecture videos is protected by copyright law, which states that it is illegal for students to share or distribute copyright materials. Students who violate copyright law are at risk of being sued by the owners of the material.

Some examples of illegal distribution include:

- posting videos of a lecture on a web site, either your own or someone else's
- posting photographs or screen captures of lecture slides on a web site
- posting notes, assignments and other intellectual property to web sites

University Policies

Important Sessional Dates

Includes sessional start and end dates, drop deadlines, and withdrawal dates.

See 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 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

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

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