# SYLLABUS FOR MATH 105 951, TERM 2020S

## UBC, VANCOUVER

## Acknowledgement

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

## Course Information

| Course Title | Course Code Number | Credit Value |
|---|---|---|
| Integral Calculus with Applications to Commerce and Social Sciences | MATH 105 951 | 3 |

## Prerequisites

Any of the following courses: MATH 100, MATH 102, MATH 104, MATH 110, MATH 111, MATH 120, MATH 180, or MATH 184.

## Contacts

| Course Instructor(s) | Contact Details | Office Location | Office Hours |
|---|---|---|---|
| Delphin Sénizergues | `senizergues [at] math [dot] ubc [dot] ca`, expect a response in 1 business day | N/A | Office hours held on Collaborate Ultra, Mon. 3-4pm, Wed. 2-3pm |

## Other Instructional Staff

**TA** in charge of monitoring Piazza: Elizabeth Xiao

## Course Structure and Learning Outcomes

The course is divided into three parts. Roughly speaking, we will cover some basics of multivariable calculus before the first midterm. We will then cover the theory of integration and review some integration techniques before the second midterm. After that, we will see some of their applications to differential equations and probability and end by discussing sequences and series. The goal of this course is to gain a better understanding of the concepts discussed in the course, notably by going through many examples. In the end, the student should be able to apply the different techniques developped on the examples to solve similar problems.

The lectures will takes place through Collaborate Ultra, directly accessible from the Canvas page of the class. The result of what the instructor writes on the digital blackboard will be available to students as a pdf file shortly after each lecture, as well as a recording of the lecture.

During each lecture, the instructor will ask simple questions to the students that they will answer using Canvas to assess their comprehension and to motivate them to engage with the material that is presented. The participation of students to those quizzes (independently of the correctness of their answers) will be recorded and counts for 10 percent of the final grade.

Outside of class, the students are encouraged to share remarks, ask and answer questions or simply discuss other topics on the online Piazza forum for the course. The idea is to create a space for students to interact and build a community. In order to incentivize students to do so, 10 percent of the final grade will be computed from their participation to the forum.

## Schedule of Topics

Here is a tentative schedule of the topics that we will cover throughout the weeks, with the corresponding reference for those topics in the textbooks.

**Week 1**: points, vectors, lines, planes, surfaces (CLP3: 1.1, 1.2 1.4, 1.7),

**Week 2**: functions of two variables, partial differentials, extrema of functions, method of Lagrange multipliers, (CLP3: 2.2, 2.3, 2.9, 2.10)

**Week 3**: definite integral, fundamental theorem of calculus, substitution rule, integration by parts (CLP2: sections 1.1 to 1.4)

**Week 4**: trigonometric integrals, trigonometric substitution, partial fractions (CLP2: sections 1.7 to 1.10)

**Week 5**: numerical integration, improper integrals, differential equations, probability (CLP2: sections 1.11 to 1.12, 2.4 and Probability appendix)

**Week 6**: sequences, series, convergence tests, power series (CLP2: sections 3.1 to 3.3, 3.5)

## Learning Activities

Participation in class using clicker-type questions that the students will have to answer on Canvas.

Participation to the Piazza forum.

WebWork.

## Learning Materials

This course is going to be based on CLP online textbooks, freely available at:

- `https://www.math.ubc.ca/~CLP/CLP2/ (Integral Calculus)`
- `https://www.math.ubc.ca/~CLP/CLP3/ (Multivariable Calculus)`

by Profs. Feldman, Rechnitzer, and Yeager.

We will also refer to the associated problem books:

- `https://www.math.ubc.ca/~CLP/CLP2/problem_book_clp2.pdf`
- `https://www.math.ubc.ca/~CLP/CLP3/problem_book_clp3.pdf`

Extra notes will be provided on Canvas for the material concerning probability.

## Assessments of Learning

**Grading scheme**: The final grade, out of 100, is divided in the following way:

- Final exam 30
- Midterms 15+15
- WebWork 20
- Participation to in-class quizzes 10
- Participation to Piazza 10

**Final**: the final exam will take place during the week of August 17-23, and will be scheduled by UBC at a later date.

**Midterms**: the tentative dates for the midterms are:

- Wednesday, July 23: 1-2pm
- Wednesday, August 06: 1-2pm

**Webwork**: Our weekly homework assignments will use the online Webwork system. Webwork assignments will be posted every week on Monday at 12:01 am, and they are due the following Tuesday (after 8 days) at 1:59 pm.

## University Policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the `https://senate.ubc.ca/policies-resources-support-student-success`UBC Senate website.

## Learning Analytics

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas, Webwork, Piazza. Many of these tools capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I plan to use analytics data to:

- View overall class progress
- Track your progress in order to provide you with personalized feedback
- Review statistics on course content being accessed to support improvements in the course
- Track participation in discussion forums
- Assess your participation in the course

## Academic Misconduct

- UBC takes cheating incidents very seriously. After due investigation, students found guilty of cheating on tests and examinations are usually given a final grade of 0 in the course and suspended from UBC for one year.
- Note that academic misconduct includes misrepresenting a medical excuse or other personal situation for the purposes of postponing an examination or quiz or otherwise obtaining an academic concession.

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