MATH 371 Section F19N01
Introductory Real Analysis
Sep – Dec 2019

VANCOUVER ISLAND UNIVERSITY

Time & Location: Mon, Wed & Fri 8:30-9:30 in Bldg 360 Rm 323

Instructor: Glen Pugh
glen.pugh@viu.ca (This is by far the best way to reach me!)
Bldg 359 Rm 201
(250)753-3245 ext. 2752

Office Hours: Mon & Wed 1:00-2:00, Fri 10:30-11:30 or by appointment

webpage: http://web.viu.ca/pughg/Fall2019/math371F19N01

This page will be updated regularly with announcements, handouts, homework assignments and solutions.

Prerequisite: Min. "B-" in MATH 123 and min. "B-" in either MATH 200 or MATH 221.

Text: *Basic Analysis – Introduction to Real Analysis* by Jiří Lebl

This text is available online (for free!) at

http://www.jirka.org/ra/realanal.pdf

Course Outline: This is a first course in Real Analysis. For this introductory treatment, you may think of Real Analysis as a behind-the-scenes look at calculus. When we write

$$\lim_{x \to 0} \frac{\sin x}{x} = 1$$

what do we really mean? Intuitively, this says that as x gets close to zero, $\sin(x)/x$ gets close to 1, but that's rather vague; what do we mean by 'gets close to'? In Real Analysis we precisely define this notion of closeness and introduce the language and notation needed to prove results like the one above. These new tools allow us to rigorously prove much deeper results such as Taylor's Theorem and the Fundamental Theorem of Calculus. We'll also see how this (necessarily) formal theory has interesting and unexpected consequences which sometimes challenges our intuition. The sequence of topics is nicely presented in the first seven chapters of the text:

0. Introduction and Set Theory
1. Real Numbers
2. Sequences and Series
3. Continuous Functions
4. The Derivative
5. The Riemann Integral
6. Sequences of Functions

As we progress through the material we will learn the important language, notation and proof techniques which are fundamental to many other fields (differential equations, complex variables, harmonic analysis, probability, etc.)

Homework: Eight to ten problem sets will be assigned throughout the term. The homework assignments are worth 50% of your final grade.

Tests: We will have two 55 minute class tests given on the following **Wednesdays: Oct 9** and **Nov 27.** Material for class tests will be drawn from your homework problems. Some of the main theorems covered in class may also be included. Prior to each test I will announced a set of 'test focus' problems and theorems. Each test is worth 10% of your final grade.

Final Exam: There will be a comprehensive final exam in December worth 30% of your grade. The exam period is Dec 9-18 2019. Travel plans should not be made until the final exam schedule is released, which is at least one month before exams begin. **In no event will the final exam be rescheduled to accommodate travel plans.**

Grading Summary:

Homework:	50%
Class Tests (2):	20%
Final Exam:	30%

Grading Scale:

90-100% : A+	76-79% : B+	64-67% : C+	50-54% : D
85-89% : A	72-75% : B	60-63% : C	0-49% : F
80-84% : A-	68-71% : B-	55-59% : C-	

Attendance: Attendance will not be taken, however you are encouraged to attend all lectures. If you miss class, read the textbook sections covered and borrow notes from a classmate. I do not lend my class notes.

Disability Access Services: VIU's Disability Access Services (DAS) provides services to students with learning disabilities, mental health disabilities, attention deficit hyperactivity disorder, autism, chronic medical conditions, and impairments in mobility, hearing, and vision.

If you have a disability requiring academic accommodations in this course but are not yet registered with DAS, please contact them at

disabilityaccessservices@viu.ca

or visit them in BLDG 200 (2nd floor). If you are already registered with DAS, please provide me with your accommodation letter, either in person during my office hours or by email.

Student email: Ensure that you have an active email address listed in your student record and that you check it regularly. I occasionally email the class with reminders or notices.