MATH 371 Section S18N01
Introductory Real Analysis
Jan – Apr 2018

VANCOUVER ISLAND UNIVERSITY

Time & Location: Mon & Wed 10:30-11:30 in Bldg 370 Rm 111;
Fri 10:30-11:30 in Bldg 360 Rm 323

Instructor: Glen Pugh
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Bldg 359 Rm 201
(250)753-3245 ext. 2752

Office Hours: Mon & Wed 12:00-1:00, Fri 12:30-1:30 or by appointment

webpage: http://web.viu.ca/pughg/Spring2018/math371S18N01

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

Prerequisite: Minimum B- in each of Math 123 and Math 200

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 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: Feb 14** and **Apr 4.** 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 April worth 30% of your grade. The exam period is Apr 19-30 2018. 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.

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.