#### Course Syllabus Math – 326: Introduction to Analysis Spring 2014

Professor: lan Besse	Office: Price 208
Email: besse.ian@pacificu.edu	Office Phone: 503-352-1498
Lecture Times: MWF 1:00 – 2:05PM	Lecture Location: Price Hall 214
Textbook: Understanding Analysis,	Office Hours:
Stephen Abbott, Springer, 2001	MWF 9:00 – 10:15, or by appointment.

#### **Course Description:**

The main objective of this class is to deeply understand the fundamental ideas of analysis first encountered in Calculus. The class develops a facility with central ideas such as the convergence of sequences and series, continuity, and differentiation. We will see why rigorous proof is essential to this understanding, and in particular how it develops intuition and leads us to results that would otherwise be inaccessible.

Prerequisite: MATH 122 with a minimum grade of C or placement.

#### **Resources:**

**Textbook**: Students must purchase the textbook. A copy of Chapter 1 will be posted on Moodle. **Moodle**: Assignments, supplemental materials, and grades can be viewed on the course Moodle site. **Office Hours**: Please visit my office hours whenever you need assistance with the course material.

#### **Course Format and Grading:**

**Homework (20%):** Many of the homework exercises are formal mathematical proofs. Proofs will be graded on logical reasoning, correct use of notation, clarity and concision. Some homework exercises will be written, some will be presented to the class. Written homework must be completed on 8.5" x 11" paper stapled in the upper left corner with name and assignment listed on the first page. Students will each present 3 exercises, each of which is worth the same as a written homework assignment. **Projects (10%):** Each chapter of the text includes a section that is to be read in a more interactive manner, with exercises embedded within the section. We will treat these sections as group projects. Each group will need to work together to complete the exercises embedded in that section and write up their results using LaTeX, a computer program designed for typesetting mathematics. Details of the project and of LaTeX will be made available on Moodle.

**Midterm Exams (35%):** There will be two midterm exams. The first will be held on *Wednesday, February 26* and the second will be held on *Monday, April 7*. Midterm exams will be administered during class time, may be cumulative, and may have a non-calculator portion.

**Final Exam (35%):** The final exam is on *Friday, May 9 at 8:30 – 11:00.* You must take the final at this time. Please make your travel arrangements accordingly.

#### Course grade breakdown:

Overall %	Letter Grade	
[93,100]	A	
[90,93)	A-	
[87,90)	B+	
[83,87]	B	
[80,83]	В-	
[77,80]	C+	
[73,77]	C	
[70,73]	C-	

[60,70)	D
[0,60)	F

Important Dates: Friday, Feb. 7: Last day to add/drop courses with no record.

Mar. 22 – 30: Spring Break – No class Friday, April 11: Last day to withdraw Wednesday, April 23: Senior Projects Day Friday, May 9: Final Exam, 8:30 – 11:00 AM

#### **Expectations:**

As a student enrolled in this course, you are expected to:

- Attend class, participate in class discussions, and ask questions
- Familiarize yourself with sections of the textbook prior to their coverage in lectures
- Complete all assigned work neatly, thoroughly, and on-time
- Work enough additional problems to ensure comprehension of course material
- Seek assistance from instructor during office hours when difficulties arise

You should expect your instructor to:

- Arrive on-time for lectures
- Deliver well-prepared lectures
- Establish clear course expectations
- Evaluate coursework in a timely manner and provide constructive feedback
- Be accessible and approachable outside of class
- Promote an inclusive, supportive, and collaborative classroom environment

# **Attendance Policy**

Attendance is expected. Students with a record of arriving late or missing class will receive a warning and an alert of academic difficulty may be filed with the Associate Dean for Student Academic Affairs. If the behavior continues, further action (from a lower final grade to dismissal from the course) may result. Absences due to official Pacific University events are excused as long as you let me know at least one week in advance. In such cases, we will work together to schedule a time for you to complete a quiz or exam that is missed because of such an event.

# Late/Missed Coursework Policy

Due dates for all coursework are firm and late work is not accepted for credit. However, I understand that periodically circumstances outside of a student's control prevent the timely submission of work. In recognition of this fact, every student's lowest homework score and lowest quiz score will be dropped prior to calculation of the final grade.

# **Academic Misconduct Policy**

Pacific University has no tolerance for academic misconduct/dishonesty. It is university policy that all acts of misconduct and dishonesty be reported to the Associate Dean for Student Academic Affairs. Sanctions that may be imposed for such misconduct range from an "F" for the assignment, an "F" for the course, and suspension or dismissal from the university. Forms of academic misconduct include but are not limited to plagiarism, fabrication, cheating, tampering with grades, forging signatures, and using electronic information resources in violation of acceptable use policies.

# Learning Support Services for Students with Disabilities

If you have documented challenges that will impede your learning in any way, please contact our LSS office in Scott Hall (ext.2107). The Director will meet with students, review the documentation of their disabilities, and discuss the services that Pacific offers and any appropriate ADA accommodations for specific courses.

# **Tutoring and Learning Center (TLC)**

The TLC is located in Scott Hall 127. The center focuses on delivering one-on-one and group tutoring services for math and science courses and writing skills in all subjects. Students should consult with the center's director for information on tutoring available for other subjects. Day and evening hours; walk-ins welcome!

# **Course Calendar**

Week	Monday	Wednesday	Friday
Jan. 27, 29, 31	1.1 & 1.2 Reviewing	1.3 Supremum, Infimum,	1.4 Cardinality, Density,
	Natural Numbers, Sets,	and the Axiom of	and other consequences
	Logic and Proof	completeness	of completeness
Feb. 3, 5, 7	1.4 Continued	1.5 Project 1: Cantor's	Snow Day
	2.1 Discussion:	theorem	
	Rearrangements of		
Fab 10 12 14	2.2 Limit of a Sequence	2.2 Algobraic and Order	2.2 Algobraic and Order
Feb. 10, 12, 14	2.2 Limit of a Sequence	Limit Theorems	2.3 Algebraic and Order
Feb 17 19 21	2 4 The Monotone	2 5 Bolzano-Weierstrass	2.6 The Cauchy Criterion
100.17,10,21	Convergence Theorem	Theorem	
	and Infinite Series		
Feb. 24, 26, 28	2.7 Properties of Infinite	Midterm Exam 1	2.7 Properties of Infinite
	Series		Series
Mar. 3, 5, 7	3.1 The Cantor Set,	3.2 Topology of R: Open	3.3 Compactness; The
	cardinality and fractal	and Closed sets	Heine-Borel Theorem
	3.2 Topology of R: Open		
Mar 10 12 14	3 3 Compactness: The	3.4 Perfect Sets and	3.5 <b>Project 3</b> . The Baire
	Heine-Borel Theorem	Connected Sets	Category Theorem
Mar. 17, 19, 21	4.1 Discussion: examples	4.2 Functional Limits	4.3 Continuous Functions
	of Dirichlet and Thomae		
Mar. 24, 26, 28	Spring Break	Spring Break	Spring Break
	No Class	No Class	No Class
Mar. 31, Apr. 2, 4	4.4 Continuous Functions	4.5 Consequences of	4.6 Project 4: Sets of
	on Compact Sets;	Continuity: The	discontinuity
		Theorem	
Apr 7 9 11	Midterm Exam 2	5 1 Discussion: are	5.2 Derivatives and the
, pr. 7, 0, 11		derivatives continuous?	IVP
App. 44, 40, 40		5.4 Project 5: Continueus	
Apr. 14, 16, 18	5.3 Mean value Theorem	5.4 Project 5: Continuous	6.1 Discussion: Proposing Processos
A			
Apr. 21, 23, 25	6.2 Uniform convergence	Senior Projects Day	6.3 Uniform convergence
Apr. 28, 30, May	6.4 Series of functions	6.5 Power Series	6.6 <b>Project 6</b> : Taylor
2			Series
May 5	Review		

#### Final Exam: Friday, May 9, 8:30 – 11:00 AM

Be advised that everything listed in this syllabus is somewhat tentative and subject to minor changes as circumstances dictate. However, any changes that become necessary will be communicated as soon as possible to students during lectures, via email, and/or on Moodle.