Math 104, Spring 2010 Course Log

Date: 1/11
Sections: 1.3, 1.4
Assignment: Syllabus problems, sections 1.3 and 1.4.
Notes: Math 104 review sessions meet in Burnett 115, 3:30-4:20, Tuesdays and Thursdays.

Date: 1/13
Sections: 1.5
Log: Limits. Calculation of limits. Properties of limits. Examples: Functions $f(x)$ for which $\lim_{x \to c} f(x)$ does not exist. Functions $f(x)$ for which $\lim_{x \to c} f(x)$ exists but is not equal to $f(c)$. Computing limits in the “0/0” case.
Assignment: Syllabus problems from section 1.5, first set.

Date: 1/15
Sections: 1.5, 1.6
Assignment: Syllabus problems from 1.5, second set.
Notes: Quiz 1, over 1.5, will be given on 1/20.

Date: 1/20
Sections: 1.6, 2.1
Log: Continuity. The slope of a tangent line as the limit as $\Delta x \to 0$ of the slope of the secant line.
Assignment: Syllabus problems from 1.6.

Date: 1/22
Sections: 2.1
Log: The derivative as the slope of a tangent line. Computing derivatives. Finding the equation of the tangent line to a graph at a given point. Differentiability.
Assignment: Syllabus problems from 2.1.
Notes: Quiz 2, over 2.1 and 2.2, will be given on Wendesday, 1/27.

Date: 1/25
Sections: 2.2
Assignment: Syllabus problems from 2.2.
Date: 1/27
Sections: 2.3
Log: Average and instantaneous rates of change. Marginals (derivatives). Marginal cost, marginal revenue, marginal profit. The demand function \( p = f(x) \). Quiz 2.

Assignment: Syllabus problems from 2.3.
Notes: Exam 1, covering material from sections 1.3-1.6 and 2.1-2.4, will be given on Wednesday, 2/3.

Date: 1/29
Sections: 2.3, 2.4, 2.5

Assignment: Syllabus problems from 2.3 and 2.4.
Notes: The outline for exam 1 has been posted.

Date: 2/1
Sections: Review, 2.5
Log: Review for exam 1. The generalized power rule (GPR) version of the chain rule. The chain rule in \( d \)-notation.

Date: 2/3
Log: Exam 1.

Date: 2/5
Sections: 2.6, 2.7

Assignment: Syllabus problems from 2.5 and 2.6.
Notes: Quiz 3, over 2.6 and 2.7, will be given on Wednesday, 2/10.

Date: 2/8
Sections: 2.7, 2.8

Assignment: Syllabus problems from 2.7.

Date: 2/10
Sections: 2.8

Assignment: Syllabus problems from 2.8.

Date: 2/12
Sections: 3.1
Log: Increasing and decreasing functions. Critical numbers. Charting the sign of the derivative.

Assignment: Syllabus problems form 3.1. Read example 6.
Notes: Quiz 4, over 3.1 and 3.2, will be given on Wednesday, 2/17.
Date: 2/15  
Sections: 3.1, 3.2  
Assignment: Syllabus problems from 3.1. Read example 5.

Date: 2/17  
Sections: 3.2  
Assignment: Syllabus problems from 3.2. Read example 5.

Date: 2/19  
Sections: 3.3  
Log: Concavity, inflection points and the second derivative test.  
Assignment: Syllabus problems form 3.3.  
Notes: Quiz 5, over 3.3 and 3.4, will be given on Wednesday, 2/24.

Date: 2/22  
Sections: 3.4  
Log: Optimization. Setting up optimization problems, primary and secondary equations, etc.  
Assignment: Syllabus problems from 3.4.

Date: 2/24  
Sections: 3.5  
Assignment: Syllabus problems from 3.5.  
Notes: Exam 2, over 2.6-2.8 and 3.1-3.5, will be given on Wednesday, 3/3.

Date: 2/26  
Sections: 3.6  
Log: Horizontal and vertical asymptotes of rational functions.

Date: 3/1  
Log: Review.

Date: 3/3  
Log: Exam 2.

Date: 3/5  
Sections: 3.6, 3.7  
Log: Asymptotes of rational functions. Graphing. Domain, intercepts, asymptotes, increase, decrease, critical numbers, critical points, concavity, inflection points.  
Assignment: Syllabus problems form 3.5.  
Notes: Quiz 6, over 3.6, will be given on Wednesday, 3/10.
Date: 3/8
Sections: 3.7
Log: Graphing.
Assignment: Syllabus problems form 3.7.
Notes: Quiz 6, over 3.6, will be given on Wednesday, 3/10.

Date: 3/10
Sections: 3.8
Log: Differentials, the tangent line approximation (principal of linear approximation) and marginal analysis.
Assignment: Syllabus problems from 3.8.
Notes: Quiz 6.
Notes: Quiz 7, over 3.8 will be given on Wednesday, 3/24.

Date: 3/12
Sections: 3.8, 4.1
Assignment: Syllabus problems from 4.1.
Notes: Quiz 7, over 3.8 will be given on Wednesday, 3/24.

Date: 3/22
Sections: 4.2
Log: The natural exponential function \( \exp(x) = e^x \). Compound and continuously compounded interest. The effective rate of interest. Present value.
Assignment: Syllabus problems from 4.2.

Date: 3/24
Sections: 4.3
Log: Derivatives of exponential functions. Quiz 7.
Assignment: Syllabus problems from 4.3.
Notes: Exam 3, over material from sections 3.6, 3.8 and 4.1-4.4, will be given on Wednesday, 3/31.

Date: 3/26
Sections: 4.4
Log: The natural logarithm function \( \ln x \). Properties of the natural logarithm. Solving exponential equations. Applications to finance.
Assignment: Syllabus problems from 4.4.

Date: 3/29
Log: Review.

Date: 3/31
Log: Exam 3.
Date: 4/2
Sections: 4.5, 4.6
Log: Differentiation of logarithmic functions. Exponential growth and decay. Radioactive decay. The half-life.
Assignment: Syllabus problems from 4.5.
Notes: Quiz 8, over 4.5 and 4.6, will be given on Wednesday, 4/7.

Date: 4/5
Sections: 4.6, 5.1
Assignment: Syllabus problems from 4.6.

Date: 4/7
Sections: 5.1

Date: 4/9
Sections: 5.1, 5.2
Assignment: Syllabus problems from 5.1.
Notes: Quiz 9, over material from 5.1 and 5.2, will be given on Wednesday, 4/14.

Date: 4/12
Sections: 5.2
Log: Integration by substitution.
Assignment: Syllabus problems from 5.2.

Date: 4/14
Sections: 5.3
Log: Integration, exponential and logarithmic functions.
Assignment: Syllabus problems from 5.3
Notes: Exam 4, covering material from sections 4.5, 4.6 and 5.1-5.4, will be given on Wednesday, 4/21.

Date: 4/14
Sections: 5.3
Log: Integration, exponential and logarithmic functions.
Assignment: Syllabus problems from 5.3
Notes: Exam 4, covering material from sections 4.5, 4.6 and 5.1-5.4, will be given on Wednesday, 4/21.

Date: 4/16
Sections: 5.3, 5.4
Log: Integration of logarithmic functions. Area and the definite integral.
Assignment: Syllabus problems from 5.3.
Date: 4/19
Sections: 5.4
Log: The Fundamental Theorem of Calculus (FTC).
Assignment: Section 5.4, 23-45 odd.

Date: 4/21
Log: Exam 4.

Date: 4/23
Sections: 5.4
Assignment: Syllabus problems from 5.4.

Date: 4/26
Sections: 5.5
Log: The area bounded by two graphs. Areas below the x-axis. The supply-demand equilibrium point. The consumer surplus. The producer surplus.
Assignment: Syllabus problems from 5.5.
Notes: The final exam will be on Thursday, May 6th, 6:00-8:00 PM, in Ferguson 217. Bring your UNL ID.

Date: 4/28
Sections: 5.6
Log: The midpoint rule for approximating definite integrals. Improving the approximation by increasing n.
Assignment: Syllabus problems from 5.6.
Notes: The final exam will be on Thursday, May 6th, 6:00-8:00 PM, in Ferguson 217. Bring your UNL ID.

Date: 4/30
Log: Review for the final exam.
Notes: The final exam will be on Thursday, May 6th, 6:00-8:00 PM, in Ferguson 217. Bring your UNL ID.