Math 154 – WvEB Calculus

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Textbook: <u>Essential Calculus, Early Transcendentals</u>, by James Stewart, 1st Ed. Thomson Brooks/Cole, 2007.
    (ISBN 0495014281 – hardback)

Pre-Requisites: C or better in WvEB Calculus (Math 153)

The general goals of this course are common to all the courses in the Institute for Math Learning at WVU:

- CONCEPTUAL UNDERSTANDING: rather than just rote memorization of algorithms
- MULTIPLE APPROACHES: to examine problems from analytical, geometric and numeric perspectives, to make judgments about the appropriateness of the choice of formal or approximate methods of solution
- TECHNOLOGY AS A TOOL: use technology as an integral part of the process of formulation, solution, and communication, to gain experience in selecting the proper tool for a given problem
- ACTIVE STUDENT LEARNING: to engage in the exploration and discovery of concepts and to learn to work cooperatively to solve problems
- COMMUNICATION OF IDEAS: to demonstrate understanding by explaining in written or oral form the meanings and applications of concepts
- PROBLEM SOLVING: gain experience as a problem solver, to analyze problems in an organized manner
- APPLICATIONS: use mathematics to model and solve problems

The specific goals of this course will be to stress an algebraic, graphic, and numeric approach to the study of:
- the concept of function and families of functions
- using functions as models and applying modeling techniques to problem solving
- using the derivative as a tool to solve problems involving rates of change

To accomplish course goals, the class incorporates interactive laboratories which use technology and student activities that emphasize writing and student collaboration. Students will work in pairs or triads on the laboratories in order to develop mathematical communication skills. The development of your communication skills is an integral part of the course.

Evaluation: Multiple forms of assessment will be used to measure your understanding of algebraic concepts and problem solving. The point distribution of these assessments is:

	Assessment	Number	Points	Percent of Grade
1	Participation	?	100	11.11%
2	Homework	14	100	11.11%
3	Labs	10	100	22.22%
4	Tests	3	400	44.44%
5	Comprehensive Final	1	200	22.22%
TOTAL			900	100%

Grading Scale:
    90% – 100%   A
    80% – 89%   B
    70% – 79%   C
    60% – 69%   D
    0% – 59%   F

Participation and Attendance: You will be awarded up to 100 participation points for the course. Each individual course facilitator will determine how 80 of these points are awarded for any combination of points from attendance,

homework, portfolio, notebook, or other school requirement. The remaining 20 points will be earned from a variety of course requirements (surveys, Discussion Board posts).

Homework: Homework will be graded in two ways. A small number of questions will be graded for correctness on eCampus. These questions will be due at 8:00 AM on the day of the test that covers that material. Students will have multiple attempts for these homework assignments. Students must also complete all of the problems on the extended homework list. The in-class teacher will check this homework (0%, 25%, 50%, 75%, or 100%). Students receive that percent of the score on they earned on the eCampus part.
Homework Grade = (Teacher Percent) x (eCampus Score)

Laboratories: There will be 10 laboratory assignments, which should be done with a partner. All ten lab worksheets will be done on paper and turned in. Each lab will be worth 10 points.

Tests: There will be three tests given throughout the semester; each is worth 135 points. **All tests** are individual assessments and are to be proctored. They are closed book and closed note. No formula sheets, computer screens other than the test, or notes (paper, nor calculator) are permitted. NO CALCULATORS WILL BE ALLOWED ON TESTS. The Final Exam must be received by **4:00 PM on Friday, May 8**.

Calculus Post-Test: The Calculus Post-Test is worth up to 10 points of Extra Credit.

$1 \leq$ number correct ≤ 14, earn 1 bonus point	$27 \leq$ number correct ≤ 28, earn 6 bonus points
$15 \leq$ number correct ≤ 18, earn 2 bonus points	$29 \leq$ number correct ≤ 30, earn 7 bonus points
$19 \leq$ number correct ≤ 20, earn 3 bonus points	$31 \leq$ number correct ≤ 32, earn 8 bonus points
$21 \leq$ number correct ≤ 22, earn 4 bonus points	$33 \leq$ number correct ≤ 34, earn 9 bonus points
$23 \leq$ number correct ≤ 26, earn 5 bonus points	$35 \leq$ number correct ≤ 40, earn 10 bonus points

Post-ACT Test: The Post-ACT Test is worth up to 10 points of Extra Credit.

$1 \leq$ number correct ≤ 21, earn 1 bonus point	$40 \leq$ number correct ≤ 41, earn 6 bonus points
$22 \leq$ number correct ≤ 28, earn 2 bonus points	$42 \leq$ number correct ≤ 44, earn 7 bonus points
$29 \leq$ number correct ≤ 31, earn 3 bonus points	$45 \leq$ number correct ≤ 47, earn 8 bonus points
$32 \leq$ number correct ≤ 34, earn 4 bonus points	$48 \leq$ number correct ≤ 49, earn 9 bonus points
$35 \leq$ number correct ≤ 39, earn 5 bonus points	$50 \leq$ number correct ≤ 60, earn 10 bonus points

Grade Disputes: If you feel that a question was graded incorrectly on a Quiz, Lab, or Test, then you MUST contact Mr. Schraeder within 2 weeks of the release of the score (when it is posted on eCampus). Any dispute brought up after 2 weeks will NOT be considered. Check your grades often to make sure that they are accurate.

Social Justice and Disability: West Virginia University is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (304-293-6700).

This course has been certified as part of WVU's Liberal Studies Program, Math and Natural Sciences (cluster C). The course will focus in part on developing your ability to communicate effectively, understand alternative views and cultures, and use quantitative and scientific knowledge accurately.

Help: On an average, you should expect to study two hours outside of class for each one hour in class. If you are spending more, then you may need to seek help! There are several excellent sources for such help. First, seek help from your classmates; use the WEBCT discussion group to get help or set up a study group. Often classmates can explain the problem clearly since they have been working on it. You may also seek assistance from your facilitator.

Homework List

Section 3.9	Related Rates	2, 3, 4, 5, 9, 14, 15, 16, 17, 18, 22, 29
Section 3.10	Linear Approximation	2, 6, 16, 19, 21, 33, 34, 35
Section 3.11	Hyperbolic Functions	1, 2, 5, 6, 8, 9, 11, 13, 20, 30, 31, 42, 46, 48, 51
Section 4.1	Min/Max, Critical Points and Closed Interval Method	1, 10, 13, 29, 30, 31, 32, 35, 36, 37, 39, 47, 61
Section 4.2	Mean Value Theorem	5, 6, 7, 8, 11, 12, 13, 14
Section 4.3	Increasing/Decreasing Functions, Concavity	1, 2, 9, 11, 19, 22, 23, 24, 34, 37, 43
Section 4.4	L'Hopital's Rule	8, 9, 15, 19, 20, 27, 32, 43, 47, 51, 52, 58, 59, 62, 63, 69
Section 4.5	Curve Sketching	Lab Worksheet
Section 4.7	Optimization	1, 2, 3, 7, 8, 13, 14, 15, 18, 21, 25, 27, 34
Section 4.9	Antiderivatives	1, 2, 4, 5, 7, 9, 12, 13, 15, 16, 21, 23, 25, 27, 31, 39, 41
Section 5.1	Riemann Sums	4, 5, 15, 17, 19, 22, 26 (4 summation problems)
Section 5.2	Definite Integral	1, 7, 13, 15, 21, 22, 23, 33, 34, 35, 36, 37
Section 5.3	Evaluating Definite Integrals	3, 5, 7, 9, 11, 13, 19, 21, 23, 25, 27, 29, 35, 47, 49, 59, 61, 63, 69
Section 5.4	Antiderivatives	8, 9, 11
Section 5.5	Substitution	1, 3, 4, 5, 7, 9, 10, 17, 21, 23, 25, 28, 34, 55, 62, 67, 68

Tentative Schedule

Unit	Week	Section	Lecture	Lab	Test
1	1	3.9	Related Rates		
	2	3.9	Related Rates	Lab 1	
	3	3.10 – 3.11	Linear Approximation, Hyperbolic Functions		
	4	4.1	Min/Max, Critical Points and Closed Interval Method	Lab 2	
	5	4.2	Mean Value Theorem		
2	6	4.3	Increasing/Decreasing Functions, Concavity		Test 1
	7	4.4	L'Hopital's Rule	Lab 3	
	8	4.5	Curve Sketching	Lab 4	
	9	4.7	Optimization	Lab 5	
3	10	4.9, 5.4	Antiderivatives	Lab 6	Test 2
	11	5.1 – 5.2	Riemann Sums, Definite Integral	Lab 7	
	12	5.3	Evaluating Definite Integrals	Labs 8, 9	
	13	5.5	Substitution	Lab 10	
	14		Review		Test 3
	15		Review		
	16		Review		Final Exam