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NORTH CAROLINA STATE UNIVERSITY
Department of Mathematics
MA 141: Distance Education

To: MA 141-651 Students, 10-week Summer Session 2020
From: Dr. John Griggs (**https://jrgriggs.wordpress.ncsu.edu**) (jrgriggs@ncsu.edu)

Welcome to MA 141! I sincerely hope you have a positive learning experience using the taped lectures. I trust that you will contact me when you need my help. The two ways to reach me are through my email (jrgriggs@ncsu.edu), or by phone (personal cell: 919-608-9726). Please **identify yourself as a MA 141 distance education student**. If you are asking a question about a specific problem, clearly identify the problem/section and write out or type out all of your steps so I can try to help you find your mistake, if there is one. A teaching assistant will also be available for your questions; your TA this summer is **Ethan Scheper (eschepe@ncsu.edu)**. If you have mediasite problems, please notify DELTA Support Services (515-9030).

The videos were taped during the Fall '16 semester (15 week-session) in a studio/classroom on campus. The textbook for this course is Calculus I for Engineers and Scientists, by Franke, Griggs and Norris. It is an e-book and is housed on WebAssign under RESOURCES. You will pay one fee that covers both the WebAssign homework and the e-book. We have been working on this book for more than five years; please read it and study the examples.

Testing situations have changed drastically in this era of quarantining and social distancing. If you are home for the summer living with your parents, then one of your parents can serve as your remote test proctor. You will need to text me a picture of your proctor holding up the proctor forms before you take the test. If your personal situation is different from this, you and I will need to have a discussion of who can serve as a responsible test proctor. If testing centers resume operation, then I will want you to use these sites for test taking.

Final average: **60% Test Average**; **30% Final Exam**; **10% Webassign Homework**

A "built-in" curve for all students is to have your worst test count half as much as the other two tests. It will not be replaced, but will hopefully "hurt you less" by only counting it once while the other two tests are counted twice in determining your test average.

TEST DATES:

Test 1:	Wednesday, June 3
Test 2:	Thursday, June 25
Test 3:	Monday, July 20
Final Exam:	Monday, July 27

Homework will be delivered/submitted over the web using Webassign: http://webassign.ncsu.edu . Please contact me or the TA when you need help with the homework problems.. The answers to the odd problems in the book are at the end of each section. I have tried to work a lot of similar problems in class. Please note the "communication" of the step-by-step process. Your work on your tests communicates your mathematical understanding of the concepts. Take good class notes. Work additional problems from each section; just the webassign by itself is not enough to prepare for excellence.

NORTH CAROLINA STATE UNIVERSITY
Department of Mathematics
MA 141 – 651
10-Week Summer Session 2020

PACING GUIDE

Wednesday, May 13 through Tuesday, June 2:

Textbook coverage: Chapter 0 (all); Chapter 1 (all); Chapter 2 (2.1, 2.2, 2.3)
(lecture #1 – lecture #18)

Test #1: Wednesday, June 3

Thursday, June 4 through Wednesday, June 24:

Textbook coverage: Chapter 2 (2.4, 2.5, 2.6, 2.7); Chapter 3 (3.1, 3.2, 3.3, 3.4)
(lecture #19 – lecture #39)

Test #2: Thursday, June 25

Friday, June 26 through Friday, July 17:

Textbook coverage: Chapter 3 (3.5, 3.6); Chapter 4 (all); Chapter 5 (5.1)
(lecture #40 – lecture #56)

Test #3: Monday, July 20

Tuesday, July 21 through Friday, July 24:

Textbook coverage: Chapter 5 (5.2); review entire textbook for final exam
(lecture #57 - #63 for new material; lecture #1 - #63 for final exam)

Comprehensive Final Exam: Monday, July 27 (grades posted by July 30)

Math WebAssign Student Help Sheet

1. **Log In**

You can do these assignments on any computer provided that you have Internet Access with Netscape Navigator 4.0 or higher or Internet Explorer 5.0 or higher. If you are doing this from home, go to step 3. If you have logged into the campus system before, then your login ID and password is the same as before. If this is your first time logging in, then your login ID is generally the first letter of your first name, 1st letter of your middle name and the first 6 letters of your last name unless you have been told otherwise. If your name was john Michael Doe, your login ID would be *jmdoe*. Do not use spaces or upper case letters in your login ID or password. Your password is your student ID # (no dashes).

If you have any problems logging in to UNIX, see the lab consultant in HA 244 or if a consultant is not available, call a consultant at the Hillsborough Building at 515-3035. They can answer questions regarding your login ID and your password ONLY.

2. **Open Netscape or Internet Explorer**

If you are using the NSCU UNIX system, click on your middle mouse button to pull up a menu called "Application Menu". Choose "Netscape Web Browsers" and **wait** for it to load. IF a gray window pops up with the options "Accept" or "Do not accept", **choose "Accept"**. If you are at home, you will need an internet connection. If you have one, you can use either Netscape or Internet Explorer.

3. **Start your Assignment**

In your Internet browser, there is a box at the top labeled "Net Site" or "Address". Inside that box type:

http://webassign.ncsu.edu

Click on the link Continue Login, this will bring up a prompt to type in your login ID and your password. This will bring you to the Assignments Summary page. Begin your assignments by clicking on the name of your assignment. Type in your answers and click the submit button at the bottom of the page. If you get a red X next to an answer that means it is wrong. You can change the answer and re-submit anytime before the due date.

4. **Log Out**

After you finish your assignments, remember to close your web browser (Netscape/Explorer). If you are on a UNIX computer, type *logout* in the brown window labeled "xterm".

If you need help, come to the Math Multimedia Center in SAS Hall 2105. Tutors and Video taped courses are available. The phone number is 515-3157.

NORTH CAROLINA STATE UNIVERSITY
Department of Mathematics
Objectives MA141
Summer 2020

I. Recognize and graph equations for conic sections and for parametric equations.

II. Conceptual and visual representation of limits, continuity, differentiability, and tangent line approximations for functions at a point. (Use Maple to find limits, automated differentiate, and use the limit-definition of derivative to differentiate.)

III. Apply the limit theorems, the Squeeze Theorem, left and right limits, and limits involving infinity and L'Hospital's Rule.

IV. Approximate roots of an equation using Intermediate Value Theorem and Newton's Method. (Use Maple to find exact solution to equations and to approximate roots via Newton's Method)

V. Apply the power rule, product rule, quotient rule and the chain rule to functions explicitly and implicitly for finding derivatives.

VI. Use derivatives in practical applications, such as distance, velocity, acceleration and related rates. Use first and second derivative tests to optimize functions and to find critical numbers, inflection points, extreme points, and the shape of the graph.

VII. Sketch a possible graph of a function given the graph of its derivatives.

VIII. Antidifferentiate basic functions, use Riemann Sums to estimate areas under the curve, and apply Fundamental Theorem of Calculus to evaluate definite integrals.

Note: There is a brief review of precalculus, including algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions including construction of new functions from old.

MA141 DELTA: Index of Course Lectures:

Day #1: Chapter 0 (sets; real numbers; properties; distance formula; ellipses)

Day #2: Chapter 0 (ellipses continued; parabolas)

Day #3: Chapter 0 (hyperbolas; inverses)

Day #4: Chapter 0 (functions; incr/decr/conc up/conc down; polynomials; trig)

Day #5: Chapter 0 (logs; exponents; factorial; binomial expansion; parametric cur.)
Chapter 1 (limits)

Day #6: Chapter 1 (discontinuities; average speed vs. instantaneous speed

Day #7: Chapter 1 (slope of secant vs. slope of tangent; epsilon/delta def of limit)

Day #8: Chapter 1 (one-sided limits; two-sided limits; horizontal asymptotes)

Day #9: Chapter 1 (no limit; slant asymptotes; continuity; contin on its domain)

Day #10: Chapter 1 (squeeze theorem; contin of trig functions; IVT)

Day #11: Chapter 1 (IVT for determining roots; instantaneous velocity)

Day #12: Chapter 1 (average velocity; instantaneous velocity)
Chapter 2: (definition of derivative; alternate def of derivative)

Day #13: Chapter 2 (slope of tangent line; vertex of a parabola using derivative)

Day #14: Chapter 2 (continuous vs. differentiable; derivative "does not exist")

Day #15: Chapter 2 (contrapositive statement; review for Test #1)

Day #16: Chapter 2 (after Test #1; derivative rules; product rule; quotient rule)

Day #17: Chapter 2 (power rule; higher order derivatives)

Day #18: Chapter 2 (general power rule; distance-velocity-acceleration)

Day #19: Chapter 2 (normal line; begin derivatives of trig functions)

Day #20: Chapter 2 (correction from Day 19; derivatives of trig)

Day #21: Chapter 2 (chain rule)

Day #22: Chapter 2 (chain rule for parametric equations; deriv. of comp. function)

Day #23: Chapter 2 (chain rule; tangent line error; implicit differentiation)

Day #24: Chapter 2 (implicit differentiation; higher order derivatives with implicit)

Day #25: Chapter 2 (derivative of inverse trig; derivative of general exponential)

Day #26: Chapter 2 (deriv of nat exponential; deriv of log function; gen power rule)

Day #27: Chapter 2 (logarithmic differentiation; limit definition of e)

Day #28: Chapter 2 (general power rule; begin related rates)

Day #29: Chapter 2 (related rates continued)

Day #30: Chapter 2 (finish related rates; more examples; review for Test #2)

Day #31: Chapter 3 (after Test #2; eqn of tan line; linear approx; Newton's Method)

Day #32: Chapter 3 (Newton's Method; IVT; extreme value(s) of functions)

Day #33: Chapter 3 (rel max/min; global max/min; find critical points of polynom)

Day #34: Chapter 3 (critical points of non-polynomial)

Day #35: Chapter 3 (Rolle's Theorem; Mean Value Theorem; begin use of 2nd deriv)

Day #36: Chapter 3 (concavity and point(s) of inflection)

Day #37: Chapter 3 (finish concavity; max/min word problems; optimization)

Day #38: Chapter 3 (more optimization example problems)

Day #39: Chapter 3 (more optimization example problems)

Day #40: Chapter 3 (standard indeterminate forms; L'Hopital's Rule)

Day #41: Chapter 3 (more indeterminate forms)

Day #42: Chapter 3 (more indeterminate forms; differentials; error term)

Day #43: Chapter 3 (more differentials; general antiderivatives; power rule)

Day #44: Chapter 3 (antiderivatives; derivative rules – in reverse)

Day #45: Chapter 3 (antiderivatives – exponentials; sum/diff; trig; rev for Test #3)

Day #46: Chapter 4 (after Test #3; summation; approx area under a curve)

Day #47: Chapter 4 (exact area using Riemann Sums and summation formulas)

Day #48: Chapter 4 (exact area; negative area; area under split-domain function)

Day #49: Chapter 4 (properties of def integrals; Fundamental Thm of Calculus)

Day #50: Chapter 4 (more Fundamental Thm of Calculus; chain rule)

Day #51: Chapter 4 (more FTOC; integration using substitution)

Day #52: Chapter 4 (more integration using substitution)

Day #53: Chapter 4 (more integration using substitution; integration by parts)

Day #54: Chapter 4 (more integration by parts)

Day #55: Chapter 4 (reduction formula; finish integration by parts)

Chapter 5 (area between two curves)

Day #56: Chapter 5 (more area between two curves; type 2 region)

Day #57: Chapter 5 (more type 2 regions; volumes of solids of revolution – disk)

Day #58: Chapter 5 (more volume of solids of rev; washer method)

Day #59: Chapter 5 (volumes by slicing; review for Test #4)

Day #60: Chapter 5 (after Test #4; volumes using cylindrical shells)

Day #61: Chapter 5 (finish cylindrical shells; final exam review)

Day #62: Chapters 1, 2, 3, 4, 5 (final exam review)

Day #63: Chapters 1, 2, 3, 4, 5 (final exam review)