

Math 110.3 01 T1 Q1 - Course Outline, 2006 Spring and Summer Session.

LECTURES: MTWRF, 8:00 - 10:20, Thorv 110.

LAB: MTWRF, 10:30 - 11:20, Thorv 110.

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OFFICE HOURS: If you want to see your instructor in his office, please make an appointment: see him before or after class, call his office or send him an e-mail.

TEXTBOOK: James Stewart, *Single variable calculus: early transcendentals*, 5th Edition, Thomson Learning, Belmont 2003. Other editions of this book are suitable, but page and section references in this information sheet and homework problems are taken from the 5th edition.

LECTURES AND LABS: The M-F 8:00 - 10:20 period will be devoted to lectures on new material. There will be a 10 minutes long break in the middle of each lecture. The lab periods will be devoted to exercises and problems illustrating the new material. Homework will be also discussed. **The lab is an essential part of this class.**

EVALUATION: 14 assignments, counting for a total of 10% of your mark, 2 midterm tests, each counting for 20% of your mark for a total of 40% and final examination counting for 50% of your mark.

EXAMINATIONS: Midterm exams will be held during the lecture periods on **May 23rd** and **May 29th**. Durations of each midterm test will be 60 minutes. Final examination will take place on **Tuesday, June 6th at 9:00 a.m.** All examinations will be closed book: no calculators, notes or formula sheets will be permitted. **Please be advised that cheating on an examination is considered a serious offence and can be met with disciplinary actions, including suspension or repulsion.** All examinations will be multiple choice tests of up to 20 (midterms) or 50 (final) questions. There will be no make up exams. Students who miss either one of the midterm exams for legitimate reasons will have the value of that examination transferred to the final examination thereby increasing the value of the final examination accordingly.

HOMEWORK: Problems from each section of the text are attached to this course outline. There are two kinds of problems: **practice exercises** and **assignments**. Practice problems will not be handed in or graded, but it is strongly advised to solve all of them (or as many as your time permits) before you start working on assignments - in order to get familiar with new definitions, theorems and examples. Assignments are to be completed and handed in for grading - there are 14 short assignments consisting of 5-6 problems, approximately each for one lecture (see course calendar). They will be returned in the following lecture. The list of problems to be discussed during labs and the list of topics to be covered during lectures are also enclosed. It is suggested that you have a look to the textbook before each class and skim the material to be instructed (see course calendar).

MATH HELP CENTRE: There is a Math Help Centre in room 15 McLean Hall. Its hours of operation will be posted on the web page: <http://math.usask.ca/math-help>.

COURSE CALENDAR:

May 15:: Appendix A, *Numbers, Inequalities, and Absolute Values*, pp. A2-A10, Appendix B, *Coordinate Geometry and Lines*, pp. A10-A16, Appendix D, *Trigonometry*, pp. A24-A33,

Lab problems: Appendix A: 9, 25, 27, 44, 49, 51; Appendix B: 1, 7, 21, 31, 43, 46; Appendix D: 1, 7, 23, 29, 40, 65, 73.

Practice problems: Appendix A: 1-8, 15, 16, 21, 22, 26, 28, 34, 35, 45, 50, 52; Appendix B: 2-6, 8-10, 22-30, 32-35, 44, 45, 47-51; Appendix D: 2-6, 8-12, 24-28, 30-34, 41-53, 55-58, 66-71, 74, 75.

Assignment 1: Appendix A: 56; Appendix B: 36, 52; Appendix D: 54, 72, 76 - **due May 16.**

May 16:: §1.1 *Four Ways to Represent a Function*, pp. 11-24, §1.2, *Mathematical Models: A Catalog of Essential Functions*, pp. 25-38.

Lab problems: §1.1: 19, 23, 30, 37, 47, 61.

Practice problems: §1.1: 21, 24-26, 31-36, 38, 39, 48-50, 62-65; §1.2: 1-7.

Assignment 2: §1.1: 22, 27, 40, 51, 55, 66 - **due May 17.**

May 17:: §1.3 *New Functions from Old Functions*, pp. 38-48, §1.5, *Exponential Functions*, pp. 55-63.

Lab problems: §1.3: 2, 22, 31, 35, 41, 45, 54; §1.5: 3, 17.

Practice problems: §1.3: 3-6, 9-21, 32, 36-39, 42-44, 46-53, 55; §1.5: 4-12, 14.

Assignment 3: §1.3: 7, 40, 56; §1.5: 13, 18 - **due May 18.**

May 18:: §1.6 *Inverse Functions and Logarithms*, pp. 63-77, §2.1, *The Tangent and Velocity Problems*, pp. 87-92.

Lab problems: §1.6: 3, 5, 9, 18, 23, 35, 51, 63; §2.1: 3.

Practice problems: §1.6: 4, 6-8, 10, 12, 19, 24-27, 36-38, 49, 50, 64-67; §2.1: 4-9.

Assignment 4: §1.6: 11, 28, 52, 54, 68 - **due June 19.**

May 19:: §2.2 *The Limit of a Function*, pp. 92-104, §2.3, *Calculating Limits Using the Limit Laws*, pp. 104-113.

Lab problems: §2.2: 4, 13, 15, 19, 23; §2.3: 3, 11, 13, 17, 23, 33.

Practice problems: §2.2: 5, 6, 8, 9, 24-29; §2.3: 4-9, 12-30, 34-37.

Assignment 5: §2.2: 7, 14, 30; §2.3: 14, 20, 30, 38 - due May 23.

May 23:: **Midterm Test I**, §2.5, *Continuity*, pp. 124-135.

Lab problems: §2.5: 10, 16, 21, 31, 37, 41, 43a.

Practice problems: §2.5: 11-13, 17-19, 22-27, 32-34, 38, 43b, 43c.

Assignment 6: §2.5: 14, 20, 28, 39, 42, 43d - due May 24.

May 24:: §2.6, *Limits at Infinity: Horizontal Asymptotes*, pp. 135-149, §2.7, *Tangents, Velocities, and Other Rates of Change*, pp. 149-157, §2.8, *Derivatives*, pp. 158-164.

Lab problems: §2.6: 3, 5, 13, 20, 23, 37; §2.7: 1, 7; §2.8: 4, 13, 19.

Practice problems: §2.6: 4, 6, 7, 13-34, 38-41; §2.7: 1-20; §2.8: 5-7, 14-17, 20-23.

Assignment 7: §2.6: 8, 25, 42; §2.8: 8, 18, 24 - due May 25.

May 25:: §2.9 *The Derivative as a Function*, pp. 165-175, §3.1, *Derivatives of Polynomials and Exponential Functions*, pp. 183-192.

Lab problems: §2.9: 1, 4, 5, 21, 23, 27; §3.1: 3, 7, 11, 17, 23, 31, 39, 45, 55.

Practice problems: §2.9: 2, 3, 6-11, 21-31; §3.1: 3-32, 40, 41, 45-49.

Assignment 8: §2.9: 12, 30; §3.1: 30, 42, 50, 56 - due May 26.

May 26:: §3.2 *The Product and Quotient Rules*, pp. 192-198, §3.4, *Derivatives of Trigonometric Functions*, pp. 211-217.

Lab problems: §3.2: 1, 12, 5, 13, 23, 31, 38; §3.4: 1, 7, 15, 21, 35.

Practice problems: §3.2: 3-22, 24-28, 32; §3.4: 1-16, 22-25, 36-40.

Assignment 9: §7.3: 15, 10, 8, §7.4: 10, 22, 32, 38 - due May 29.

May 29:: **Midterm Test II**, §3.5, *The Chain Rule*, pp. 217-227.

Lab problems: §3.5: 1, 2, 7, 8, 19, 39.

Practice problems: §3.5: 3-6, 7-42.

Assignment 10: §3.5: 11, 20, 29, 40, 46 - due May 30.

June 30:: §3.6, *Implicit Differentiation*, pp. 227-235, §3.7, *Higher Derivatives*, pp. 236-242.

Lab problems: §3.6: 5, 15, 25, 41, 55, 59; §3.7: 5, 11, 23, 29, 33.

Practice problems: §3.6: 5-20, 26-29, 42-49, 56, 60-61; §3.7: 5-20, 24-27, 30-31, 34-36.

Assignment 11: §3.6: 18, 30, 50, 62; §3.7: 28, 32, 37 - due May 31.

May 31:: §3.8 *Derivatives of Logarithmic Functions*, pp. 244-249, §3.10, *Related Rates*, pp. 256-262.

Lab problems: §3.8: 2, 13, 20, 35; §3.10: 8, 10, 12.

Practice problems: §3.8: 1-23, 36-45; §3.10: 7-38.

Assignment 12: §3.8: 24, 32, 46; §3.10: 16, 26, 36 - due June 1.

June 1:: §4.1 *Maximum and Minimum Values*, pp. 279-288, §4.2, *The Mean Value Theorem*, pp. 290-296.

Lab problems: §4.1: 3, 11, 15, 20, 31, 54; §4.2: 1, 5, 11, 15, 17.

Practice problems: §4.1: 4-6, 12-14, 15-29, 32-45, 47-62; §4.2: 2, 3, 12, 13, 18, 19.

Assignment 13: §4.1: 30, 46, 62; §4.2: 4, 14, 20 - due June 2.

June 2:: §4.3 *How Derivatives Affect the Shape of a Graph*, pp. 296-307, §4.5, *Summary of Curve Sketching*, pp. 316-324.

Lab problems: §4.3: 1, 11, 21, 26, 45.

Practice problems: §4.3: 2, 12-19, 22, 23, 27-29, 33-52; §4.5: 1-52.

Assignment 14: §4.3: 20, 30, 47; §4.5: 12, 40 - due June 5.

June 5:: §4.7 *Optimization Problems*, pp. 331-341.

Lab problems: §4.7: 26, 34.

Practice problems: §4.7 1-38.

June 6:: **Final examination.**