



## Course Syllabus – Mathematics for Business and Social Sciences

### MATH 1324.203 – Spring 2018

**Department:** Mathematics and Engineering

**Instructor:** Denise Johansen

**Discipline:** Mathematics

**Office:** RC 223D; (806)716-4632

**Course Number:** Math 1324

**Cell/Text:** (513)227-0095

**Course Title:** Math for Bus and Social Sciences

**Email:** djohansen@southplainscollege.edu

**Credit:** 3 **Lecture:** 3 **Lab:** 1

**Time/Place:** TR 4pm-5:15pm/RC 232

**Office Hours:** MTWR 8-8:30am and 10:30am-11am, TR 2:30pm-4pm, F 9am-12pm, or by appointment

**This course satisfies a core curriculum requirement:** Yes – mathematics

**Prerequisites:** 2 years of high school algebra or Math 0320, TSI compliance

**Textbook (Optional):** **College Mathematics for Business, Economics, Life Sciences, and Social Sciences**, Barnett, Ziegler, and Byleen, 13th ed . Pearson Publishing.

**Supplies (Required):** graphing calculator (TI 83/84), MyMathLab access (Course ID: johansen19604).

**Course Description:** The application of common algebraic functions, including polynomial, exponential, logarithmic, and rational, to problems in business, economics, and the social sciences are addressed. The applications include mathematics of finance, including simple and compound interest and annuities; systems of linear equations; matrices, linear programming; and probability, including expected value.

**Course Purpose/Rationale/Goal:** The purpose/rationale of the course is to introduce students to the fundamental principles in business mathematics including functions, systems of equations, linear programming, and financial math and to prepare students to study Business Calculus.

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**Course Requirements:** To maximize the potential to complete this course, a student should attend all class and laboratory meetings, take notes and participate in class, complete all homework assignments and examinations including final examinations.

## Course Evaluation:

- There will be in-class assignments collected daily. By their very nature, in-class assignments can NOT be made up. The in-class average is worth 10% of your grade, and the lowest 2 in-class grades will be dropped.
- Daily online homework assignments will be due weekly, before class on Tuesdays. Late homework will be accepted with 10% per day late submission penalty! The homework average is worth 10% of your grade, and the lowest 3 homework grades will be dropped.
- Daily pre-class assignments will be posted and due before each lecture. Late pre-class assignments will be accepted with 10% per day late submission penalty!. The pre-class average is worth 5% of your grade.
- There will be 6 online Quizzes to be **completed on your own and without references**. Quizzes are due before class on the Tuesday after a chapter is completed. Late quizzes will be accepted with 10% per day late submission penalty! The Quiz Average is worth 10% of your grade, and the lowest quiz grade will be dropped.
- There will be 3 in-class exams. These will each be worth 15% of your grade. If an exam is missed for a legitimate reason, a makeup exam may be given. It is your responsibility to contact me to schedule a makeup exam.
- There will be 1 in-class cumulative final exam on **Thursday, May 10<sup>th</sup> from 3:15pm-5:15pm**, worth 20% of your grade.

## Letter Grades:

90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
59% & below	F

## Student Learning Outcomes/Competencies:

Upon completion of this course and receiving a passing grade, the student will be able to:

1. Functions: Student will
  - 1.1. identify, evaluate, characterize and graph linear, polynomial, rational, exponential and logarithmic functions. (1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6)
  - 1.2. determine the domain of a function. (2.1)
2. Linear Models: Student will
  - 2.1. set up and solve linear business functions: cost, revenue, profit. (1.1,)
  - 2.2. set up and solve problems involving break-even points. (1.1)
  - 2.3. set up and solve problems involving equilibrium points. (1.2)
3. Finance: Student will
  - 3.1. use business formulas to calculate simple and compound interest. (2.5, 3.1, 3.2)
  - 3.2. use business formulas to calculate effective rates. (3.2)
  - 3.3. use business formulas to evaluate annuities. (3.3, 3.4)
4. Systems of Equations: Student will

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- 4.1. solve systems of equations: by substitution, elimination, Gauss-Jordan elimination and matrix inversion. (4.1, 4.3, 4.6)
- 4.2. analyze the nature of the solution to a system of equations. (4.1)
- 4.3. apply the use of technology to perform matrix operations, find the inverse of a matrix, and solve systems of equations. (4.2, 4.4, 4.5)
- 4.4. set up and solve applications involving systems of equations. (4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7)
5. Linear Programming: Student will
  - 5.1. use graphical methods to solve linear programming problems. (5.3)
  - 5.2. use the Simplex Method to solve linear programming problems. (6.1, 6.2, 6.3, 6.4)
  - 5.3. set up and solve applications involving linear programming problems. (5.3, 6.1, 6.2, 6.3, 6.4)
6. Algebra: Student will
  - 6.1. simplify and factor algebraic expressions involving polynomials, rational expressions, exponents, and radicals. (A.2, A. 3, A.4, A.5, A.6)
  - 6.2. solve linear, quadratic, exponential, logarithmic and rational equations. (1.1, 2.3, 2.4, 2.6, A.7)

### Core Objectives:

#### Communication Skills:

effective development, interpretation, and expression of ideas through written, oral, and visual communication.

- Develop, interpret, and express ideas through written communication
- Develop, interpret, and express ideas through oral communication
- Develop, interpret, and express ideas through visual communication

#### Critical Thinking:

creative thinking, innovation, inquiry, analysis, evaluation, and synthesis of information.

- Generate and communicate ideas by combining, changing, and reapplying existing information
- Gather and assess information relevant to a question
- Analyze, evaluate, and synthesize information

#### Empirical and Quantitative Competency Skills:

the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

- Manipulate and analyze numerical data and arrive at an informed conclusion
- Manipulate and analyze observable facts and arrive at an informed conclusion

**Attendance Policy:** Students are expected to attend all classes in order to be successful in a course. The student may be administratively withdrawn from the course when absences become

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excessive as defined in the course syllabus. **[Absences for this course are considered excessive if you have 4 in a row or a total of 8. If you reach 4 consecutive absences or a total of 8 absences, you will be administratively withdrawn from the class with a grade of 'X' or 'F'.]**

When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. It is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor. Students are officially enrolled in all courses for which they pay tuition and fees at the time of registration. Should a student, for any reason, delay in reporting to a class after official enrollment, absences will be attributed to the student from the first class meeting.

Students who enroll in a course but have "Never Attended" by the official census date, as reported by the faculty member, will be administratively dropped by the Office of Admissions and Records. A student who does not meet the attendance requirements of a class as stated in the course syllabus and does not officially withdraw from that course by the official census date of the semester, may be administratively withdrawn from that course and receive a grade of "X" or "F" as determined by the instructor. Instructors are responsible for clearly stating their administrative drop policy in the course syllabus, and it is the student's responsibility to be aware of that policy.

It is the student's responsibility to verify administrative drops for excessive absences through MySPC using his or her student online account. If it is determined that a student is awarded financial aid for a class or classes in which the student never attended or participated, the financial aid award will be adjusted in accordance with the classes in which the student did attend/participate and the student will owe any balance resulting from the adjustment.

**Last day to drop is Thursday, April 26<sup>th</sup>.**

### **SPC School Holidays:**

Monday, 1/15, Martin Luther King Holiday

Monday-Friday, 3/12-3/16, Spring Break

Monday, 4/2, Easter Holiday

**Academic Integrity:** It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own any work which he or she has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension.

**Cheating:** Dishonesty of any kind on examinations or on written assignments, illegal possession of examinations, the use of unauthorized notes during an examination, obtaining information during an examination from the textbook or from the examination paper of another student, assisting others to cheat, alteration of grade records, illegal entry or unauthorized presence in an office are examples of cheating. Complete honesty is required of the student in the presentation of

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any and all phases of course work. This applies to quizzes of whatever length, as well as to final examinations, to daily reports and to term papers.

**Dress Code:** Reasonable standards of decency apply to the college community. The student should dress in a manner which does not distract from the academic atmosphere. Revealing attire or clothing carrying obscene or offensive slogans is not permitted. In all academic buildings, classrooms, offices, the Student Center, and dining facilities, students are required to wear shirts and shoes.

**Language:** Please be respectful of others and use language that is appropriate to the workplace.

**Cellphones:** To limit disruptions to the class and distractions to yourself, please put your cellphone on silent mode or airplane mode. If you feel a call is an emergency that you must answer, please take the phone out in the hall before answering to minimize the disruption to class. If you feel you must leave class, please do so as quietly as possible.

**Campus Carry:** South Plains College permits the lawful carry of concealed handguns in accordance with Texas state law, and Texas Senate Bill 11. Individuals possessing a valid License to Carry permit, or the formerly issued Concealed Handgun License, may carry a concealed handgun at all campus locations except for the following:

- Natatorium

For a complete list of campus carry exclusions zones by event, please visit

<http://www.southplainscollege.edu/campuscarry.php>

**Equal Opportunity:** South Plains College strives to accommodate the individual needs of all students in order to enhance their opportunities for success in the context of a comprehensive community college setting. It is the policy of South Plains College to offer all educational and employment opportunities without regard to race, color, national origin, religion, gender, disability, or age.

**Disability Statement:** Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Special Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Special Services Coordinator. For more information, call or visit the Special Services Office in the Student Services Building, 716-2529 or 716-2530.

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## COURSE OUTLINE / CALENDAR\*

Problems are assigned online for each section of the textbook that we cover. To access online assignments, you must have an access code (you can buy a code for MyMathLab bundled with your textbook or you can buy just the code at [www.mymathlab.com](http://www.mymathlab.com)) and register for our course (Course ID: **johansen19604**) at [www.mymathlab.com](http://www.mymathlab.com). Assignments have due dates, and you will lose 10% per day for work completed after the due date passes. To master the material and prepare for the exams, you **MUST** work extra problems!

\* Assignments and deadlines are subject to change at instructor's discretion, and all changes will be announced in class and posted in MyMathLab.

Date	Content	Required Readings
Week 1 1/16 1/18	<b>Syllabus, Assessment, &amp; Linear Equations and Graphs (Part 1)</b> <ul style="list-style-type: none"> <li>• Syllabus Overview and Day 1 Assessment</li> <li>• Linear Equations and Inequalities</li> </ul>	<u>Readings</u> Chapter 1: 1.1
Week 2 1/23 1/25	<b>Linear Equations and Graphs (Part 2) &amp; Functions and Graphs (Part 1)</b> <ul style="list-style-type: none"> <li>• Graphs and Lines</li> <li>• Functions</li> </ul>	<u>Readings</u> Chapter 1: 1.2 Chapter 2: 2.1
Week 3 1/30 2/1	<b>Functions and Graphs (Part 2)</b> <ul style="list-style-type: none"> <li>• Elementary Functions: Graphs and Transformations</li> <li>• Quadratic Equations</li> </ul>	<u>Readings</u> <b>Quiz 1 Due</b> (Chapter 1) Chapter 2: 2.2-2.3
Week 4 2/6 2/8	<b>Functions and Graphs (Part 3)</b> <ul style="list-style-type: none"> <li>• Polynomial and Rational Functions</li> <li>• Exponential Functions</li> </ul>	<u>Readings</u> Chapter 2: 2.4-2.5
Week 5 2/13 2/15	<b>Functions and Graphs (Part 4) &amp; Review for Exam I</b> <ul style="list-style-type: none"> <li>• Logarithmic Functions</li> <li>• Review for Exam I</li> </ul>	<u>Readings</u> Chapter 2: 2.6
Week 6 2/20 2/22	<b>Exam I &amp; Mathematics of Finance (Part 1)</b> <ul style="list-style-type: none"> <li>• <b>Exam I</b> (Chapters 1 &amp; 2)</li> <li>• Simple Interest</li> <li>• Compound and Continuous Compound Interest</li> </ul>	<u>Readings</u> <b>Quiz 2 Due</b> (Chapter 2) Chapter 3: 3.1-3.2
Week 7 2/27 3/1	<b>Mathematics of Finance (Part 2)</b> <ul style="list-style-type: none"> <li>• Future Value of an Annuity; Sinking Funds</li> <li>• Present Value of an Annuity; Amortization</li> </ul>	<u>Readings</u> Chapter 3: 3.3-3.4
Week 8 3/6 3/8	<b>Systems of Linear Equations; Matrices (Part 1)</b> <ul style="list-style-type: none"> <li>• Review: Systems of Linear Equations in Two Variables</li> <li>• Systems of Linear Equations and Augmented Matrices</li> <li>• Gauss-Jordan Elimination</li> </ul>	<u>Readings</u> <b>Quiz 3 Due</b> (Chapter 3) Chapter 4: 4.1-4.3
3/12-16	<b>Spring Break – No Classes!</b>	

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Week 9 3/20 3/22	<b>Review and Exam II</b> <ul style="list-style-type: none"> <li>Review for Exam II</li> <li><b>Exam II</b> (Chapter 3 &amp; half of 4)</li> </ul>	<u>Readings</u>
Week 10 3/27 3/29	<b>Systems of Linear Equations; Matrices (Part 2)</b> <ul style="list-style-type: none"> <li>Matrices: Basic Operations</li> <li>Inverse of a Square Matrix</li> <li>Matrix Equations and Systems of Linear Equations</li> </ul>	<u>Readings</u> Chapter 4: 4.4-4.6
Week 11 4/3 4/5	<b>Systems of Linear Equations; Matrices (Part 3) &amp; Linear Inequalities and Linear Programming (Part 1)</b> <ul style="list-style-type: none"> <li>Leontief Input-Output Analysis</li> <li>Linear Inequalities in Two Variables</li> <li>Systems of Linear Inequalities in Two Variables</li> </ul>	<u>Readings</u> Chapter 4: 4.7 Chapter 5: 5.1-5.2
Week 12 4/10 4/12	<b>Linear Inequalities and Linear Programming (Part 2) &amp; Review for Exam III</b> <ul style="list-style-type: none"> <li>Linear Programming in Two Dimensions: A Geometric Approach</li> <li>Review for Exam III</li> </ul>	<u>Readings</u> <b>Quiz 4 Due</b> (Chapter 4) Chapter 5: 5.3
Week 13 4/17 4/19	<b>Exam III &amp; Linear Programming: The Simplex Method (Part 1)</b> <ul style="list-style-type: none"> <li><b>Exam III</b> (Chapters 4 &amp; 5)</li> <li>The Table Method: An Introduction to the Simplex Method</li> </ul>	<u>Readings</u> <b>Quiz 5 Due</b> (Chapter 5) Chapter 6: 6.1
Week 14 4/24 4/26	<b>Linear Programming: The Simplex Method (Part 1)</b> <ul style="list-style-type: none"> <li>The Simplex Method: Maximization with Problem Constraints of the Form <math>\leq</math></li> <li>The Simplex Method: Minimization with Problem Constraints of the Form <math>\geq</math></li> </ul>	<u>Readings</u> Chapter 6: 6.2-6.3
Week 15 5/1 5/3	<b>Linear Programming: The Simplex Method (Part 2) &amp; Review for Final Exam</b> <ul style="list-style-type: none"> <li>Maximization and Minimization with Mixed Problem Constraints</li> <li>Review for Final Exam</li> </ul>	<u>Readings</u> Chapter 6: 6.4
Week 16 5/10	<b>Final Exam</b> <ul style="list-style-type: none"> <li><b>Final Exam, 3:15pm-5:15pm</b></li> </ul>	<u>Readings</u> <b>Quiz 6 Due</b> (Chapter 6)

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