# Columbia College <br> Foundation Mathematics for Business Professionals (MAT113) <br> Lecture 1 <br> Course Outline 

Semester Dates: October 12, 2015 - November 14, 2015

Please note that when a holiday falls during the week, your class will be rescheduled for the Friday of that week. Students are required to make arrangements to be present at the rescheduled class.

Facilitator: Wade Breakey
Class Time: 5:30 PM to 9:30 PM (Tue./Thur.)
Credit: Non-credit Course

Email: wadeb@columbia.ab.ca
Room: 4-154
Prerequisite: None

Note: It is the student's responsibility to be familiar with the information contained in the Course Outline and to clarify any areas of concern with the facilitator.

## Course Description:

This course is for students who intend to enter a professional program at Columbia College and require a refresher in key mathematical concepts applicable to their education goals, along with an introduction to the mathematics as applied to business.
Please note: the course curriculum begins with a general and rather quick review of basic mathematical operations with whole numbers, fractions, decimals and integers. Some students may find these sections less then challenging; however, the course quickly becomes more challenging when applying these basic skills to the business context. At various stages of the program a calculator is permitted.

## Learning Outcomes:

As a result of active participation in these sessions, a student can expect to:

- Understand place-value in whole numbers, round whole numbers and perform basic operations with whole numbers.
- Use order of operations to complete a chain of operations manually and with a calculator.
- Understand the place-value of decimals, round decimals, convert fractions to decimals or decimals to fractions, and perform the basic operations with decimals manually and with a calculator.
- Recognize the three types of fractions, convert to lowest and highest terms, and perform the basic operations with fractions manually and with a calculator.
- Understand the basic concept of powers; evaluate and simplify expressions with powers.
- Understand the basic concept of roots, evaluate and simplify expressions with roots and fractional exponents manually and with a calculator.
- Understand the basic procedures used to solve linear equations, apply the five rules to solve for the unknown in seven situations and check the answers by substitution.
- Use linear equations to solve word problems.
- Understand percent operations, convert from percent to decimals and fractions and vice versa, find percent of increase or decrease, and apply percents to solve tax problems.
- Understand ratios, perform operations with ratios, and use cross-multiplication to solve problems involving proportion.
- Use the interest formula to calculate simple interest and to calculate the unknown when two of principal, rate or time is given.
- Understand the difference between simple and compound interest; use the compound interest formula to find compound interest, present value, and future value with the use of a calculator.
- Understand the difference between and calculate the mean, median, and mode for a set of data.
- Be able to read and prepare a frequency distribution table, and a bar, line and circle graph.
- Use the computer to set up a chart and graph the information on a bar graph or circle graph.
- Understand a measure of dispersion and the concept of standard deviation. Use the six steps for finding the standard deviation.
- Use the computer to do practice exercises at www.mcgrawhill.ca/college/slater and use a basic excel spreadsheet to organize data and perform calculations related to interest and standard deviation.
- Recognize a normal distribution as data being spread symmetrically about the mean. Use this graph to obtain information about the percent of data located within one or two standard deviations of the mean.
- Build vocabulary drawn from business contexts.
- Encourage students to facilitate their own learning by encouraging students to learn material in the pre-class readings and only provide instruction in those concepts that the students were unable to grasp on their own.


## Course Format:

This course uses a variety of teaching/learning methods including discussion, personal reflection, experiential exercises, student presentations, role-plays, group activities and especially case studies. Our faculty aims to create a learning environment where the learner is actively engaged in inquiry, critical thinking and problem solving. The classroom provides you with a place where you can learn with and from others in a cooperative and collaborative manner.

You are expected to take a very active part in class discussions and take responsibility for your own learning. Be a positive and co-operative team member. Columbia College uses a facilitation model of instruction where the facilitator's role is to facilitate your learning. The expectation is that you will come to class prepared with pre-class homework completed. Your facilitator will engage you in activities that are based on your completed homework and readings. Your enthusiastic and positive approach in the classroom will create an atmosphere that will help every student develop the knowledge, skills and attitudes that are needed for success.

How you conduct yourself in our classes will, to a large extent, mirror your conduct in society and your future work site. For example, if you have a tendency to ask questions, challenge the ideas of others in a respectful manner, draw out the best from your colleagues, and encourage both group development and task accomplishment in this class, it is likely you will do the same at work. A high level of student involvement and developing professionalism is expected in the classroom as you work towards your goal.

## Required Textbooks and Equipment:

Columbia College Math 113 Workbook
Financial calculator: hp10bII (by Hewlett-Packard) Also available from stores like Staples

Further Recommended Readings and Resources:
www.mcgrawhill.ca/college/slater
www.aaamath.com
http://www.khanacademy.org/ - videos, instruction in math concepts

## Success Maker, computerized drill and practice application.

Bittinger, M., Beecher, J.A. (2008). Developmental Mathematics: College Mathematics and Introductory Algebra (Referred to as CMIA): (Toronto: Pearson Addison Wesley.

## Homework Assignment Due for the First Class:

- None


## Evaluation - Assessment of Student Performance:

The final grade in the course will be based on the following elements. Wherever possible facilitators will use rubrics to assess your performance and offer feedback.

| Title of Assignment/Examination | Due Date | Weight |
| :--- | :---: | :---: |
| Daily Quizzes | Daily | $30 \%$ |
| Assignments | Daily | $15 \%$ |
| Homework | Daily | $5 \%$ |
| Final Exam | Day 10 | $50 \%$ |

Please note that all homework and assignments are due at the beginning of each class.

## Grading:

Grades for each component will be added together at the end of the semester. The final total will be translated to the Columbia College's 4.0 grading scale as follows:

## Marking and Grading Conversion:

| Description | Letter Grade | Grade Points | Percentage Scale |  |
| :---: | :---: | :---: | :---: | :---: |
| Excellent | $\mathrm{A}+$ | 4.0 | 100 | 95 |
|  | A | 4.0 | 94 | 90 |
|  | $\mathrm{~A}-$ | 3.7 | 89 | 85 |
|  | $\mathrm{B}+$ | 3.3 | 84 | 80 |
|  | B | 3.0 | 79 | 75 |
|  | $\mathrm{~B}-$ | 2.7 | 74 | 70 |
| Satisfactory | $\mathrm{C}+$ | 2.3 | 69 | 65 |
|  | C | 2.0 | 64 | 60 |
|  | $\mathrm{C}-$ | 1.7 | 59 | 55 |
| Poor | D | 1.0 | 54 | 50 |
| Failure | F | 0.0 | 49 | 0 |

Please note that the minimal passing grade is $B$ (75\%).

## Submission and Completion of Assignments:

You are expected to submit assignments by the due date. Any late assignments may be assessed a marking penalty of $5 \%$. If you are unable to submit an assignment on the due date, you must request an extension before the due date by filling out an Application for Assignment Extension form (SSPP-F012) that is to be submitted to the Department Chair for approval. This form is available on Columbia's website, Bldg. 802 - Main Office and from Department Chairs.

## Requesting an Examination Deferral:

If you are requesting an exam to be deferred, you must submit an Application for Deferred Examinations form (SSPP-F012) to the Department Chair within 48 hours of the missed examination date and time. Applications for deferred examinations will only be considered due to medical or personal emergency. A medical certificate or other appropriate documentation may be required. This form is available on Columbia's website, Bldg. 802-Main Office and from Department Chairs.

## Attendance Requirements:

Columbia College believes that student are committed to their program and learning experiences. However, it is understood that there are times when students may be absent. Any absences can be viewed as a potentially serious disruption of the learning process and necessary achievement of the learning objectives. Being late is also considered unacceptable as it interferes with the learning opportunities of others. Unavoidable absences or lateness must be reported to the course facilitator in advance. Please refer to Columbia College's Attendance Policy and Regulations (ADM-P151) for detailed information on Attendance Requirements.

## Academic Integrity:

Academic dishonesty is a serious offence and can result in suspension or expulsion from Columbia College.

There is no tolerance for academic dishonesty and any student caught plagiarizing is subject to serious sanctions as outlined in the Student Code of Conduct Policy (ADM-P229). Students are encouraged to familiarize themselves with this policy and avoid any behavior that could possibly be seen as cheating, plagiarizing, misrepresenting, or putting into question the integrity of one's academic work.

## Student Conduct:

It is the responsibility of each student to uphold the expectations and responsibilities outlined in the Student Code of Conduct Policy (ADM-P229) and any additional requirements established by your program.

Generally, each student will:

- be respectful and courteous toward others;
- demonstrate appropriate and supportive communication skills, and coach, assist, advise and otherwise support other students in their studies;
- manage any personal stress and conflict in a positive and resourceful manner, and assist others to do the same;
- be dressed in a manner appropriate for their workplace or learning environment, as established by the program;
- conduct themselves in a professional manner with regard to their communication with others and their behavior in class;
- conduct themselves with academic integrity in all of their learning activities, tests, exams, and assignments
- keep up with day-to-day classroom and course expectations.


## Important Dates:

## Description

Last to add/drop courses

Last day to withdraw without academic penalty
Final Examination

## Date

5 school operating days from the start of the semester OR before the third scheduled class, whichever is greater
$50 \%$ or less of the semester has been completed
A final exam may take many formats. If a final exam is scheduled, it will be taken in an assigned room under the supervision of a Test Proctor. Students must be on time as they will not be permitted to enter once the exam has started. Exam dates, times, and location are posted by the main office Bldg. 802 and by the library in Bldg. 4. It is the student's responsibility to check this exam posting.

## Appeals:

Please refer to the Student Appeal Policy (ADM-P177).

## Students with Temporary or Permanent Disabilities:

Students with temporary or permanent disabilities may apply for accommodations. To be considered for an accommodation, a student must register with Columbia College's Disability Services by making an appointment with a Disability Services Advisor - Main Office - Bldg. 802 or emailing disabililtyservices@columbia.ab.ca. The Department Chair or facilitator is not able to provide you with any accommodations without you taking this step. Please refer to Columbia College's website to review the Accommodation Policy and Handbook (ADM-P188).

## Student Support:

Students should be aware that Life Coaching, Career and Disability Services, and Student Support Services (i.e. tutoring, academic strategists, etc.) are provided by Columbia College. Inquire how to request these services at the Main Office in building 802. It is the student's responsibility to discuss their specific learning needs with the appropriate service provider.

## Class Schedule/Overview:

Please note that this schedule is subject to change. Any changes or cancellations will be emailed to you. It is your responsibility to check the email address you have given to the school on a daily basis for any messages from the Department Chair/designate, facilitator or College Administration. It is the student's responsibility to be familiar with the information contained in the Course Outline and to clarify any areas of concern with the facilitator.

## Class Session

## Topics

- Recognize place-value and be able to round whole numbers and decimals to the indicated place-value.
- Add, subtract, multiply and divide whole numbers.
- Apply the concept of BEDMAS to solve order of operations problems.
- Add, subtract, multiply and divide decimal numbers manually.
- Recognize the five steps for solving a word problem.
- Use a calculator to perform a chain of operations with whole numbers and decimals.
- Recognize the types of fractions and convert to highest and lowest terms.
- Convert improper fractions to whole or mixed numbers and mixed numbers to improper fractions.
- Add, subtract, multiply and divide fractions manually.
- Use a calculator to perform operations with fractions.

Scope and sequence:

- Complete a quiz on whole numbers and decimals related to the pre-class practice.
- Provide instruction in whole numbers in the areas of difficulty as indicated by the quiz results.
- Provide instruction in decimals in the areas of difficulty as indicated by the quiz results.
- Review the concept of BEDMAS and use it to evaluate a chain of operations.
- Review the five steps for solving a word problem.
- Divide the students into pairs to practice solving word problems.
- Use an on board review to check for understanding of the concepts covered thus far.
- Complete a quiz on computation with fractions.
- Provide instruction in fractions in the areas of difficulty as indicated by the quiz results.
- Preview: Introduce the concepts to be covered in session 2, the pre-class readings, and the assignments.
- Introduce students to the on-line quizzes at www.mcgrawhill.ca/college/slater
- Operations with integers and Powers and Roots
- Add, subtract, multiply, and divide integers manually.
- Understand the basic concept of powers.
- Evaluate and simplify expressions with powers.
- Apply the rules for order of operations to evaluate an expression containing powers.
- Understand the basic concept of roots.
- Simplify and evaluate expressions with roots and fractional exponents.
- Evaluate powers and roots using a calculator.
- Scope and Sequence:
- Discuss student questions relating to the concepts covered in day 1 and review some concepts as required.
- Complete a daily quiz on the homework assignments relating to the concepts covered in day 1.
- Pre-quiz on board to review operations with integers.
- Based on these results, provide instruction on the rules used to add, subtract, multiply and divide integers.
- Provide instruction in the concept of powers and evaluating expressions containing powers.
- Provide instruction in the concept of roots and simplifying expressions with roots.
- Post-quiz on board to evaluate students' understanding of powers and roots.
- Practice using a calculator to check their answers on the quiz.
- Divide students into small groups to solve selected word problems on page 57 and 83.
- Introduce students to the concepts to be covered in day 3. Review the required readings and assignments to be completed

Solve for the unknown in basic linear equations; understand the concept of percent and its application in solving problems.

- Apply the basic procedures used to solve linear equations for the unknown.
- List the 5 rules and the steps used to solve for the unknown in seven situations.
- Check the answers by substituting in the original equation.
- Use linear equations to solve word problems.
- Understand the concept of percent.
- Convert percent to decimals, fractions to percent, and mixed or decimal percent to a fraction.
- Solve for one unknown of the portion formula when the other two elements are given.
- Calculate the percent of increase or decrease in problems.
- Apply percents to the calculation of GST.


## Scope and Sequence:

- Discuss students' questions related to the homework assignment.
- Complete a daily quiz on the concepts from session 2.
- Provide instruction in solving linear equations.
- In small groups, use linear equations to solve word problems.
- Provide instruction in percent and the portion formula.
- In small groups, apply the calculation of percents to word problems.
- Review the new concepts covered this session.
- Introduce topics to be studied in day 4, review the required readings and the homework assignment.
- Set up ratios.
- Perform operations with ratios.
- Allocate values according to a ratio.
- Understand proportion as consisting of an equation consisting of two ratios.
- Use cross-multiplication to solve for the unknown in a given proportion.
- Use proportions to solve word problems.
- Obtain information from tables and charts in order to solve word problems.


## Scope and Sequence:

- Discuss students' questions related to their homework.
- Workbook pages as assigned by
- Daily quiz on concepts from session 3.
- Provide instruction on ratio and proportion.
- Divide students into small groups to solve word problems using proportion.
- On computer, complete a practice quiz on chapter 1, 2, 3, and 4 at the Mcgraw Hill site.
- Introduce concepts for session 5.
- Review required readings and assignments for next session.


## Simple Interest:

- Understand interest, interest rate, dollar value of interest, and future value.
- Use the simple interest formula to calculate simple interest and determine maturity value.
- Find an unknown in the simple interest formula.
- Rearrange the future value formula to determine the principal or present value.
- Use the calculator to determine simple interest and present value.
- Solve word problems related to simple interest.
- Use an excel spreadsheet to calculate simple interest.
- Calculate the timing and amount of payments using a time line diagram.
- Compute the equivalent value of a single payment or serial payments on any date and a final payment.


## Scope and Sequence:

- Respond to students' questions on the homework assignment.
- Daily quiz based on homework assigned.
- Introduce simple interest and use it to determine principal and present value.
- In small groups, solve word problems related to simple interest.
- Use an excel spreadsheet to find simple interest.
- Work through Unit 12-4 with the students to calculate equivalent payments and a final payment.
- Review the concepts covered today by working through several end of chapter problems on page 309.
- Introduce concepts to be covered in session 6 and review required readings and homework for next session.

| 6 | - Topics: <br> - Understand the concept of compound interest and compare it with simple interest. <br> - Determine the periodic interest rate. <br> - Calculate the compound amount and the interest manually. <br> - Use a calculator to determine present value using the formula. <br> - Calculate equivalent payments in situations involving compound interest. <br> - Apply these concepts to word problems involving compound interest. <br> - Scope and Sequence: <br> - Discuss students' questions related to the homework assignment. <br> - Daily quiz on concepts from last session. <br> - Develop and understanding of compound interest by discussing the examples in Units 14-1 to 14-4. <br> - In small groups, work through the Practice <br> - quiz for 14-2, 14-3. <br> - Preview material to be covered next session, outline preclass readings and homework assignments. | - Workbook pages as assigned by facilitator. |
| :---: | :---: | :---: |
| 7 | Topics: <br> - Define and calculate the mean. <br> - Define and calculate the median. <br> - Define and identify the mode. <br> - Prepare a frequency distribution. <br> - Prepare and interpret a bar, line, and circle graph. <br> - Explain and calculate the range. <br> - Calculate a monthly mortgage payment. <br> Scope and Sequence: <br> - Review questions related to last session's homework. <br> - Daily quiz based on the homework assignment. <br> - Use an amortization table to calculate monthly payments for a mortgage. <br> - Provide instruction in finding mean, median, and mode. <br> - Provide instruction in frequency distributions and graphs. Discuss the example on pages 400-403. <br> - Check for understanding by completing unit 17-1 and 17-2 together. <br> - Use Excel to transfer chart information to a bar or circle graph. <br> - Review the concepts to be covered in session 8 as well as the assigned readings and homework. | - Workbook pages as assigned by facilitator. <br> - On computer, complete a practice quiz on chapters 5 , 6 , and 7 at www.mcgrawhill.ca/c ollege/slater |
| 8 | Topics: <br> - Understand measures of dispersion and find the range for a set of data. <br> - Understand the six steps for finding the standard deviation. <br> - Recognize a normal distribution as data being spread symmetrically about the mean. <br> Scope and Sequence: <br> - Discuss students' questions relating to the homework assignment. <br> - Assign end of chapter problems on page 412 as a quiz. <br> - Instruct students in finding price relatives, measures of dispersion, and finding the standard deviation. <br> - Work through the examples in 17-3 with the students. <br> - Use the practice quiz 17-3 to review their understanding of standard deviation. | - Workbook pages as assigned by facilitator. |


| Class Session | Topics | Pre-Class Readings |
| :---: | :---: | :---: |
| 9 | Review: <br> - Whole numbers, decimals, and fractions. <br> - Powers and roots. <br> - Solving linear equations. <br> - Percent, ratio, and proportion. <br> - Finding simple interest. <br> - Finding compound interest. <br> - Finding mean, median, and mode. <br> - Using frequency distributions and graphs. <br> - Calculate standard deviation. <br> Scope and Sequence: <br> - In class, discuss any questions students may have relating to their homework assignment re-summary practice tests. Review areas of concern. <br> - Discuss the format of the final exam and the need to come prepared for the exam. | - Workbook pages as assigned by facilitator. |
| 10 | . Final Exam <br> Short answer section - 1 hour Written Response section - 1.5 hours | - |

Appendix 1
Assignment Rubrics

## Columbia College

 Student Engagement Rubric Last Revised: December 2011| Student's Name |  | Course Code | Date | Facilitator/Evaluator's Name |
| :---: | :---: | :---: | :---: | :---: |
| Pts | Preparation for Class | Quality of Participation | Involvement in Process | Frequency of Participation |
| 5 | - Demonstrates completion of readings or assignment and awareness of all key concepts contained in readings or assignment on a daily basis. | - Comments significantly add to the learning process; consistently demonstrates high order thinking, analysis, synthesis, and evaluation; demonstrates ability to appropriately apply concepts to real-life situations; always participates constructively in discussion on a daily basis | - Comments build on contribution of others, enabling group to integrate experiences and insights (linking theory and real-life experiences); supportive and encouraging to other class members; comments are focused and concise. | - Contributes actively and consistently to group process on a daily basis. |
| 4 | - Demonstrates completion of readings or assignment and awareness of most of the key concepts on a daily basis. | - Comments contribute to learning process; shows evidence of ability to apply concepts to real-life situations; mostly demonstrates higher order thinking skills; generally participates constructively in discussion on a daily basis. | - Comments do not always build on the contribution of others; most times shows support of other classmates. | - Contributes actively and somewhat inconsistently to group process on a daily basis. |
| 3 | - Demonstrates awareness of some key concepts or ideas contained in readings or assignment on a daily basis. | - Comments show evidence of awareness and understanding of concepts covered in the reading or assignment; inconsistently demonstrates high-order thinking; inconsistently participates in a constructive manner. | - Speaks up when asked with comments that add to understanding; inconsistently shows support of other classmates; comments tend to be at times off focus. | - Contributes inconsistently to group process. |
| 2 | - Inconsistently demonstrates awareness of concepts or ideas contained in readings or assignment; inconsistent daily preparation. | - Comments show background knowledge of basic concepts covered in the readings or assignment; little demonstration of higher-order thinking; generally, participation is not constructive | - Contributes little to group understanding; little evidence of being encouraging to others. | - Does not contribute to group except when asked. |
| 1 | - Demonstrates little or no awareness of key concepts or ideas contained in readings or assignment; little to no daily preparation. | - Comments show no evidence of awareness of concepts covered in the readings or assignment; shows no evidence of higher-order thinking; shows general lack of interest. | - Does not contribute to the group process. | - Does not contribute. |

Facilitator/Evaluator's Comments:

