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**Consultation Hrs:** By appointment through email

## Course Objective

This is a short course that prepares the fresh undergraduates for the Mathematics that they will encounter in their first year of Business courses. In particular it focuses on the area of Calculus and Statistics.

## Motivation

Fresh Business undergraduates have different Mathematics mastery and preparedness when they come to the Business school. Some have forgotten the Mathematics they learned two years ago due to serving their National Service. Some did not come from Junior Colleges and missed taking the equivalent of "O" level Additional Mathematics. This different level of Mathematics mastery among students caused difficulties in the pedagogy of the first year Business courses. This subject aims to bridge the gap among students' Mathematics mastery.

## Learning Outcome

By the end of the course, students would get a basic revision on the following topics:

- 1) Indices and logarithms
- 2) Functions
- 3) Roots of equations
- 4) Inequalities
- 5) Simultaneous equations
- 6) Coordinate geometry
- 7) Differentiation
- 8) Integration
- 9) Sequences and series
- 10) Basic probability
- 11) Basic statistics

## Mode of Teaching

Students will go through this course as e-learning. They would watch e-learning videos posted in LumiNUS, try out the exercises posted there, and finally take the Final Assessment at their own time during the semester. All students will be given a pass or fail grade based on the Final Assessment.

## Reference Text

Any "O" level Additional Mathematics text book.

## Final Assessment

All students must individually do a closed book online 1 hour quiz consisting of 15 questions through the LumiNUS website. Students are allowed unlimited attempts. They need to earn a pass grade (i.e. score 9 out of 15 marks) in one of the attempts, else they would be awarded a fail grade at the end of the semester. All students must pass this course before their graduation. Deadline: **15 Nov 2021 2359 hrs.**

## Academic Honesty & Plagiarism

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. In case of any doubts, you should consult your instructor.

Additional guidance is available at:

<http://www.nus.edu.sg/registrar/adminpolicy/acceptance.html#NUSCodeofStudentConduct> Online Module on Plagiarism: <http://emodule.nus.edu.sg/ac/>.

## Syllabus:

Lesson	Online Coverage
1	<ul style="list-style-type: none"> <li>• Topic 1 : Course Introduction Lesson 00: Intro to the Course (3:30 mins)</li> </ul>
2	<ul style="list-style-type: none"> <li>• Topic 2 : Lesson 01 Indices and Logarithms Lesson 01 Indices and Logarithms (16:32 mins)</li> </ul>
3	<ul style="list-style-type: none"> <li>• Topic 3 : Lesson 02 Functions Lesson 02a: Graphs of Functions (6:40 mins) Lesson 02b: Composite Functions (7:25 mins) Lesson 02c: Inverse Functions (3:25 mins)</li> </ul>
4	<ul style="list-style-type: none"> <li>• Topic 4 : Lesson 03: Roots of Equations Lesson 03a: Factor Theorem (5:13 mins) Lesson 03b: Polynomial Division (7:33 mins) Lesson 03c: Solving Quadratic Equations (6:36 mins) Lesson 03d: Solving Higher Degree Polynomials (6:16 mins)</li> </ul>
5	<ul style="list-style-type: none"> <li>• Topic 5 : Lesson 04: Inequalities Lesson 04a: Basic Inequality Rules (9:28 mins) Lesson 04b: Polynomial Inequalities (8:12 mins)</li> </ul>
6	<ul style="list-style-type: none"> <li>• Topic 6 : Lesson 05: Simultaneous Equations Lesson 05a: By Elimination (4:49 mins) Lesson 05b: By Substitution (5:35 mins) Lesson 05c: Higher Degree Equations (6:44 mins)</li> </ul>
7	<ul style="list-style-type: none"> <li>• Topic 7 : Lesson 06: Coordinate Geometry Lesson 06a: Equation of a Straight Line (9:19 mins) Lesson 06b: Mid-points (4:40 mins)</li> </ul>
8	<ul style="list-style-type: none"> <li>• Topic 8 : Lesson 07: Differentiation Lesson 07a: Basic differentials: polynomial, exponential, logarithm (15:45 mins) Lesson 07b: Chain Rule (3:06 mins) Lesson 07c: Product Rule and Quotient Rule (9:25 mins) Lesson 07d: Application 1: Rate of Change (7:10 mins) Lesson 07e: Application 2: Optimization (9:21 mins) Lesson 07f: Application 3: Estimation (11:29 mins)</li> </ul>
9	<ul style="list-style-type: none"> <li>• Topic 9 : Lesson 08: Integration Lesson 08a: Basic Integrals: polynomial, exponential, logarithm (12:23 mins) Lesson 08b: Application: Area under the graph, Cumulative Quantities (6:24 mins)</li> </ul>
10	<ul style="list-style-type: none"> <li>• Topic 10 : Lesson 09: Sequences and Series Lesson 09a: Arithmetic Progression (6:08 mins) Lesson 09b: Geometric Progression (7:38 mins)</li> </ul>
11	<ul style="list-style-type: none"> <li>• Topic 11 : Lesson 10: Basic Probability Lesson 10a: Sets and Events (7:14 mins)</li> </ul>

	<p>Lesson 10b: Probability Definition (6:23 mins)</p> <p>Lesson 10c: Independent Events (13:18 mins)</p> <p>Lesson 10d: Conditional Probability (10:10 mins)</p>
12	<ul style="list-style-type: none"> <li>• Topic 12 : Lesson 11: Basic Statistics</li> </ul> <p>Lesson 11a: Mean, Mode and Median (7:52 mins)</p> <p>Lesson 11b: Variance and Standard Deviation (7:19 mins)</p> <p>Lesson 11c: Covariance (5:16 mins)</p> <p>Lesson 11d: Correlation (3:52 mins)</p>
13	<ul style="list-style-type: none"> <li>• Topic 13 : Final Assessment</li> </ul> <p>This is an online quiz consisting of 15 questions to be completed in 1 hour, individual effort, and closed book including no internet checking is allowed. Scientific calculators are allowed and students should use them. Students have unlimited attempt, the score will be regarded from the best attempt. All students must pass this quiz before the end of week 13, i.e. <b>15 Nov 2019 2359 hrs</b>. The passing mark is 60%. Students who fail will have to take this course again in subsequent semesters until they pass. Students cannot graduate without passing this course.</p>