



## Lahore University of Management Sciences

### Calculus – Boot camp

### Pre Fall 2023-24

Instructor(s)	Adam Zaman, Ammar Ahmed Khan, Waqas A. Azhar, Imran Anwar
Teaching percentage	100% load by each instructor
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Secretary/TA	Shazia Zafar , Noreen Sohail

Camp Basics			
Date	07 August 2023- 18 August 2023		
Days	Mon, Tues, Wed, Thurs, Fri	Duration	90 min
Time	11:00 – 12:30	Mode	Online
Open for Students category	ALL SSE new intake will take this camp		
Section/strength	4 sections, 90 each section (tentative)		

Camp Description
Many students face troubles meeting the pace and rigor of calculus during their first semester at LUMS. Though many students have the before-hand experience of calculus but more on computational side. They lack the conceptual understanding and challenges of calculus; they mostly enter in math courses with a wrong-footed point of view and attitude. The sole purpose of this course is to let the students aware about the big picture of calculus and prepare them to get aware of the challenges and question to put their focus on right track. This boot camp will not only help them to prepare them for only calculus courses but also for courses involving mathematical modeling like Mechanics.

List of topics
All these lectures will be delivered from a conceptual and graphical point of view. Students will be provided with the take-home assignments of different level (ranging from easy to challenging ones). Students will be able to discuss these problems with the TAs' during tutorial sessions as well as may contact the instructors over the emails. <ul style="list-style-type: none"><li>• Introduction to Calculus and motivation</li><li>• Derivative and geometrical interpretations</li><li>• Optimization problems</li><li>• Trigonometric Functions Graphs and their derivatives</li><li>• Exponential and logarithmic functions</li><li>• Differential Equation &amp; Anti-derivatives – Population Models, Newton's law of cooling, Euler's method</li><li>• Summations and exhaustion techniques – Riemann sum</li><li>• Fundamental theorem of calculus – both ways</li><li>• Anti-derivatives of functions- recall and Area under the curve (applications)</li><li>• Taylor's series expansion</li></ul>

Textbook(s)/Supplementary Readings
<ul style="list-style-type: none"><li>• Quick Calculus: A Self-Teaching Guide, 2nd Edition by Daniel Kleppner (Author), Norman Ramsey (Author)</li><li>• Infinite Powers: How Calculus Reveals the Secrets of the Universe by Steven Strogatz (Author)</li></ul>