

# BM4040 Mechanobiology

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## Assignment 3

Deadline: March 22, 2024

Total marks: 60

### Instructions

1. You have to write down the answers to each question clearly.
2. Submit the assignment in PDF format at [this link](#).

### Questions

1. Following the numerical example discussed in the class, implement ligand-receptor dynamics between two rigid bodies for catch bonds. Make plots of force-displacement curves for  $\chi = 0, 0.25, 0.5, 0.75$  and  $1.0$  in a single figure. Mark each curve clearly.
2. Compare oscillatory force amplitude required for the detachment of two rigid cells adhered to each other by slip and catch bonds at different frequencies. Make plots of the number of bonds between two cells as a function of time for different force amplitudes, oscillatory frequencies, and  $\chi$ .



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