



Module PMRF-ISSS000/2023

Interfacial transport: Capillarity and wetting phenomena

Name of the PMRF student

V Venkitesh

Details of the content of the module

This course is an elementary course on interfacial fluid dynamics; pertaining to systems where surface tension is a dominating parameter. The first part of the course will provide a synopsis of basic governing equations in fluid mechanics and their revised form in systems dominated by interfacial tension. For example, shape of a drop, meniscus etc. The second part deals with dynamical systems where the fluid is in motion. Thin film flows, coating flows will be discussed. The third part of the course is focussed on interfacial instabilities such as Rayleigh-Taylor, Rayleigh-Plateau. In the final part some advanced topics will be visited such as contact line dynamics.

Introduction (Conservation equations)

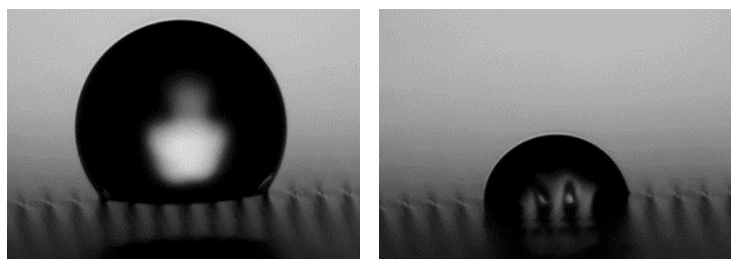
Statics: Euler-Lagrange equations, energy minimisation, Wetting and contact angles

Dynamics: Thin film flows, Coating flows, instability analysis in interfacial flows.

Contact line dynamics

Required background of the students taught

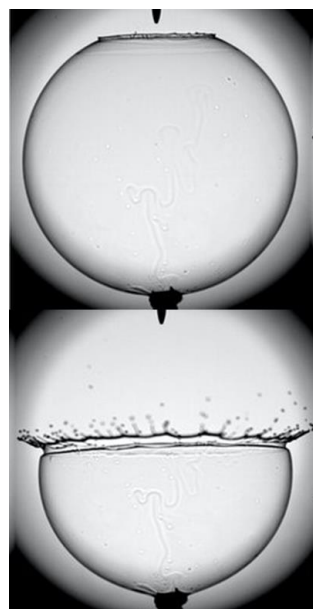
Mechanical, chemical engineering, Basic knowledge of undergraduate fluid mechanics is recommended although not necessary



Droplet on a textured surface: Cassie and Wenzel states



Breakup of a liquid jet



Rupture of a soap bubble

Schedule of the module

Start date: 27/01/2024

End date : 27/04/2024

Timings: Fri 6 pm - 7 pm , Sat 5 pm – 6 pm,

Sun 2 pm- 3 pm.

The lectures will be uploaded or presented live. Problem solving sessions will be scheduled in the given time after consultation with students.

Meeting link : Will be shared later

Contact email ID: issforum@gmail.com

Registration link:

<https://forms.gle/ia2ftBpFxfY2z5YJ6>