Proposal for a new course

Course title: **Planetary surface processes**
Course no.: SPA 621
Proposer: Ishan Sharma
Department: Space Science & Astronomy
Credits: 9 (3-0-0-0)
Note: This will be a PG course in the Department of Space Science & Astronomy. It will be compulsory for students in the Planetary Science & Technology stream.

Course description and contents:

1. Introduction – 1 lecture
2. Shapes of planetary bodies: Effect of rotation and tides; Topography – 2 lectures
3. Continuum mechanics: Stress and strain; Linear elasticity; Bending and buckling of plates; Plasticity – 5 lectures
4. Heat transfer: Fourier's law of conduction; Sources; Periodic heating and cooling; Stefan problem; Thermal stresses; Applications – 5 lectures
5. Plate tectonics: Introduction; External and internal sources; Flexures and folds; Fractures and faults; Applications – 5 lectures
6. Volcanism: Melting; Magma; Mechanics of eruption; Lava flows and domes – 4 lectures
7. Impact cratering: Morphology; Cratering mechanics; Ejecta; Scaling laws; Atmospheric effects; Applications to landscapes, dating and evolution – 7 lectures
8. Regolith and resurfacing processes: Growth; Heating; Weathering; Texturing; Creeping; Landsliding – 7 lectures
9. Wind, water and ice on planetary surfaces – 6 lectures

Textbooks

1. Melosh, H. J. 2011. *Planetary Surface Processes*. Cambridge Univ. Press.
2. Turcotte, D. & G. Schubert 2014 *Geodynamics*. Cambridge Univ. Press.

Signature of the Proposer

This course is APPROVED/NOT APPROVED Convener, DPGC
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