

Name of Programme: M. Sc. Applied Geology

Course Code: GEO-629

Title of the Course: Glaciology

No of Credits: 03

Effective from AY: 2023-24

Prerequisites for the course	Students should have undergone M.Sc. Semester I and II.	
Course objectives	To introduce the students to the processes involved in glaciation	
Content	Module 1 Introduction to Global Glaciations; distribution of glaciers and snow cover: Importance of glaciers; general principle of the meteorology of precipitation, formation of snow, physical characteristics of snow crystals, areal distribution of glaciers, snow cover and factors controlling their distribution.	15 hours
	Module 2 Morphology of glaciers: Classification of glaciers, mass balance and mechanism of ice flow; types of deformation, mineralogy /metamorphism of ice, effect of metamorphism on albedo of snow and ice, grain growth. Zones in a glacier, crevasses and icefall; flow and sliding of glaciers: Driving and resisting stresses; steady and non-steady flow of glacier.	15 hours
	Module 3 Glacial erosion and weathering: Processes of glacial transport, sedimentation. Glacial erosional and depositional landforms. Paleoglaciation: Milankovitch cycles and greenhouse effect; Little Ice Age (LIA); glacial and interglacial cycles. Glaciers and climate. Summer and winter mass balance. Dating of glacial samples.	15 hours
Pedagogy	Lectures/ tutorials/assignments /discussion	
References/ Readings	<ol style="list-style-type: none">1. Aber, J. S., Croot, D. G., & Fenton, M. M. (2012). <i>Glaciotectonic landforms and structures</i> (Vol. 5). Springer Science & Business Media.2. Benn, D. I., & Evans, D. J. (2014). <i>Glaciers & glaciation</i>. Routledge.3. Bennett, M. M., & Glasser, N. F. (Eds.). (2011). <i>Glacial geology: ice sheets and landforms</i>. John Wiley & Sons.4. Hambrey & Alean (2004): <i>Glaciers</i>, 2nd edition. Cambridge University Press.	

	<p>5. Knight, P. J. (1999): <i>Glacier Science and Environmental Change</i>. Wiley.</p> <p>6. Marshall, S. J. (2011). <i>The Cryosphere</i>. Princeton University Press.</p> <p>7. Van der Veen, C. J. (2013). <i>Fundamentals of glacier dynamics</i>. CRC press.</p>
Course Outcomes	<p>1. Student will be able to discuss the processes involved in formation of glaciers</p> <p>2. They will learn to identify erosional and weathering glacial landforms.</p> <p>3. They will learn to identify depositional glacial landforms.</p> <p>4. Students will learn to correlate the processes with climate change.</p>