



आपदा न्यूनीकरण एवं प्रबन्धन उत्कृष्टता केन्द्र, भारतीय प्रौद्योगिकी संस्थान रुड़की,

रुड़की – 247667

CENTRE OF EXCELLENCE IN DISASTER MITIGATION & MANAGEMENT, 3rd Floor,
New Building, Opposite Biotechnology Department

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE, ROORKEE – 247667, UTTARAKHAND, INDIA

Tel: 01332-28-6616 (Office), E-mail: coe_dmm@iitr.ernet.in; www.coedmm.org

1. Subject Code : **DMN- 505** Course Title : **Landslide Hazard Assessment & Mitigation**
2. Contact Hours : **L: 3 T : 1 P: 0**
3. Examination Duration (Hrs) : **Theory : 3 Practicals: 0**
4. Relative Weight : **CWS 25 PRS: 0 MTE: 25 ETE: 50 PRE: 0**
5. Credits : **4** 6. Semester: **Autumn** 7. Subject Area : **PEC**
8. Pre-requisite: **Nil**
9. Objective: To understand mapping and hazard assessment techniques of landslides and protection against landslide.
10. Details of the Course:

S. No.	Particulars	Contact Hours
1.	Definition; overview of Hazard assessment techniques on regional, semi detail and detailed scales and their application for planning purposes; Terrain classification and mapping methods, use of RS and GIS.	5
2.	Causative factors of landslides – natural including inherent factors and external factors as well as anthropogenic factors; Impacts of natural causative factors like lithology, structure, slope morphometry, relative relief, hydrogeological conditions and land use and land cover on stability of slopes ; Impacts of external factors like concentrated rain fall and earth quakes on slope stability; Various causes of slope instability in Himalaya; extreme hydro-meteorological conditions leading to landslide dams and related damages;	8
3.	Classification of landslides and mass movements, Landslide hazard zonation (LHZ) on regional scales of 1:50,000; LHZ practices in India; LHZ mapping technique suggested by Bureau of Indian Standards with examples; Application of regional scale LHZ maps;	10
4.	Landslide hazard zonation on Meso scale (1:5000); Application of Meso scale maps for town and zonal planning.	05
5.	Landslide hazard studies on detailed scale of 1:1000; Mechanics of landslide; Markland test for landslide probability; Strength of slope materials; Assessment of rock mass properties; Overview of slope stability studies for slopes characterized by overburden debris and rock materials.	08
6.	Landslide control measures – grading of slopes, retaining walls, breast walls, drainage measures, rock bolts and rock anchors, Biotechnical measures, Special toe walls and other stability measures.	4
7.	Case studies of important landslides of Himalaya and their control practices	2
	Total	42

11. Suggested Books:

S. No	Name of Books / Authors / Publisher etc.	Year of Publication
1	Mitigation of Natural hazards and Disasters: International perspective. Haque, C. Emdad, Springer, Dordrecht.	2005
2	Rock slope Engineering. Hoek and Bray. Spon Press, 4 th edition	2000
3	Environmental geosciences. Keller, E.A. John Wiley & Sons, NY	1999
4	Natural hazard risk assessment and Public policy. Petak, W.J. and Atkinson, A.D. Springer Verlag, NY	1982
5	A field manual for landslide investigations, R.Anbalagan, B. Singh, D.Chakraborty and A. Kohli. DST, Government of India, New Delhi	2007