



STRUCTURAL MEASURES FOR FLOOD RISK MITIGATION

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| Anno immatricolazione | 2017/2018 |
| Anno offerta | 2018/2019 |
| Normativa | DM270 |
| SSD | ICAR/01 (IDRAULICA) |
| Dipartimento | DIPARTIMENTO DI INGEGNERIA CIVILE E ARCHITETTURA |
| Corso di studio | CIVIL ENGINEERING FOR MITIGATION OF RISK FROM NATURAL HAZARDS |
| Curriculum | Hydrogeological risk assessment and mitigation |
| Anno di corso | 2° |
| Periodo didattico | Primo Semestre (24/09/2018 - 17/10/2018) |
| Crediti | 6 |
| Ore | 51 ore di attività frontale |
| Lingua insegnamento | English |
| Tipo esame | SCRITTO E ORALE CONGIUNTI |
| Docente | GHILARDI PAOLO (titolare) - 6 CFU |
| Prerequisiti | Basic knowledge of fluid mechanics or fluid mechanics is required. A knowledge of the main concepts of sediment transport mechanics, slope stability, and groundwater flow is warmly suggested. |
| Obiettivi formativi | <p>This course describes, analyses and compares many practical solutions for flood risk mitigation, e.g., levees, reservoirs, floodways, tools for river bank protection and for control of local scour, devices for river training, and special design techniques to be applied to buildings in flood prone areas.</p> <p>Design techniques and selection criteria of risk mitigation measures are discussed throughout this course.</p> |
| Programma e contenuti | <ol style="list-style-type: none">1. Geomorphic assessment of natural streams - field investigation, channel stability assessment, computational design methods.2. River protection - Stream bank erosion, river training and stabilization, |

flow control structures, environmental impacts, channel restoration and rehabilitation

3. Bank protection and stabilization - General principles, Riprap design and placement, Bioengineering countermeasures and erosion control, rock-and-wire mattresses, gabions, sacks, concrete blocks, used tires, soil cement

4. Scour protection at bridges and other structures - countermeasures for contraction scour and for local scour. Riprap design for bridge piers and for bridge abutments; Geotextiles filters; grouted ripraps; concrete armor units.

5. Levees - Levees in flood risk management; functions, forms and failure of levees; physical processes and tools for levee assessment and design. Hydraulic design of levees: surface protection measures, spillways, control of seepage and uplift, hydraulics of overtopping flows, mechanics of overflow erosion, erosion protection

6. Structural measures for reducing flood risk to buildings - Avoidance and resistance design options: site layout, landscaping, drainage, boundary walls and fencing, threshold and floor levels. Flood resilient design and construction: general principles, building materials, foundations, walls, doors and windows, fittings, services.

Metodi didattici

lectures with slides and multimedia. Numerical exercises with discussions on typical case studies, also using numerical tools.

Testi di riferimento

Course notes will be provided during the course.

Modalità verifica apprendimento

Oral examination with discussion on case studies.

Altre informazioni

Obiettivi Agenda 2030 per lo sviluppo sostenibile

[\\$lbl legenda sviluppo sostenibile](#)