

## REGISTRATION

The registration costs include coffee breaks, the technical visit, and banquet dinner.  
Please visit the site for more informations.

## FEES AND PAYMENT

- Students, PhDs, research fellows belonging to DICATAM: free of charge
- Other students, PhDs, research fellows: 200 €
- Engineers and practitioners: 400 €
- Engineers registered with the Brescia Engineer Chamber (Ordine): 300 €
- Engineers member of CTE or fib: 350 €

## CONTACTS

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## ORGANIZING COMMITTEE

Professor Fausto Minelli  
Professor Giovanni Plizzari  
Engineer Fabiola Iavarone  
Engineer Nico Di Stefano  
Engineer Enrico Faccin  
Engineer Stefano Giuseppe Mantelli

Visit our website at:

[bridgesummerschool.unibs.it](http://bridgesummerschool.unibs.it)



## VENUE

Set between Milan and Verona at the foot of the Alps, Brescia is the second largest city in Italy's northern Lombardy Region, with 200.000 inhabitants. The city's rich history dates back to pre-Roman times, when it was a Gallic capital. Among the many great local sights are the 11th-century "Duomo Vecchio" (Old Cathedral, also called "La Rotonda"), unique for its circular shape, the 17th-century "Duomo Nuovo" (New Cathedral) nearby, and the first-century Roman ruins at "Tempio Capitolino". Brescia is also famous for its lakes (Garda, Iseo and Idro) surrounded by mountains and vineyard-covered hills.



## HOW TO REACH UNIVERSITY OF BRESCIA

By air from these airports:

Milano Orio al Serio,  
Verona Villafranca,  
Milano Linate.

By car:

Highway A4, exit Brescia Ovest  
Highway A21, exit Brescia Centro

By train:

Brescia Railway Station

## HOW TO REACH DICATAM

The engineering school can be reached by Metro bound to Prealpino (Stop: Europa)

## HOTEL LIST

Hotel Vittoria \*\*\*\*\*  
Hotel Master \*\*\*\*\*  
DoubleTree by Hilton Brescia \*\*\*\*  
Hotel Ambasciatori \*\*\*\*  
B&B Hotel Brescia \*\*\*  
B&B Ai Musei Brescia \*\*\*  
Regal Hotel \*\*\*

# 2<sup>ND</sup> INTERNATIONAL SUMMER SCHOOL

## STRENGTHENING TECHNIQUES OF EXISTING BRIDGES

**BRESCIA**  
**JULY 4-8, 2022**

Chairmen:  
Prof. Fausto Minelli and Prof. Giovanni Plizzari

UNIVERSITY OF BRESCIA  
DICATAM  
Department of Civil, Environmental, Architectural  
Engineering and Mathematics



UNIVERSITY  
OF BRESCIA



**MAPEI**

85  
years  
1937-2022



## AIM AND SCOPE

Main objective of this Summer School is to provide innovative training ground, experience in existing bridge engineering with respect to the increasing need of safety, assessment, monitoring and retrofitting.

It is well known that traffic volumes and loads can greatly increase during the life-span of an infrastructure. The infrastructure performance can fall under a warning level and a strengthening or repairing intervention become necessary. In other cases, the environmental conditions lead to a premature deterioration of the materials and an extremely quick intervention is needed as well. Moreover, some infrastructure elements were built before the seismic codes were available or before the seismic risk was recognized.

Deterioration of materials, higher traffic loads, seismic hazard are determining the need of defining innovative structural solution and new analyses and retrofitting techniques for existing bridges.

Some bridge major collapses, occurred in the last few years worldwide, brought high attention and warning on the safety of bridges and, more in general, on the infrastructure system. There is a significant and growing need for the strengthening of existing reinforced concrete structures. Structural deterioration may have taken place, a change in use could result in heavier loading, or requirements of design and loading Standards may change.

There is a need for techniques that can provide cost effective solutions to both the design and implementation of strengthening measures. Moreover, there is a stronger need than ever to grow researchers/practitioners that combine a robust academic foundation in structural analysis/conceptual design with practical experiences, technological expertise with awareness of the socio-economic impact in the field of existing infrastructures.

Hence, main goal of the Summer School is to offer innovative background, both analytical and practical, on structures and infrastructures, as well as laboratory experience.

The Summer School will be supported by the international Association for Structural Concrete (*fib*) and by the Engineering Chamber of Brescia.

## WHO SHOULD ATTEND

V year engineering students, Graduate students, PhDs, post-doctoral researchers, university staff and practitioners willing to do research and applications in the field of bridges and infrastructures.

## CAREER OPPORTUNITIES

The school is a unique chance to meet peers, experts and practitioners in the field.

## COURSE OUTLINE

- Structural analysis and advanced design methods for existing bridges;
- Assessment of existing bridges: definition of structural deficiencies, material degradation, corrosion, seismic events, impacts;
- Strengthening Techniques: FRP, FRC, FRCM, classical steel and concrete-to-steel techniques;
- Intervention strategies;
- Case studies on existing bridges;
- New Italian Guidelines for risk classification and management, safety assessment and monitoring of existing bridges;
- Advanced inspections in critical post-tensioned bridges.

## INTERNATIONAL AND NATIONAL LECTURES

Hugo Corres Peiretti, Full Professor, UPM (Madrid), Past President of *fib*

Marco Di Prisco, Full Professor, Politecnico di Milano

Radhouane Masmoudi, Full Professor, University of Sherbrooke (Canada)

Fausto Minelli, Full Professor, University of Brescia

Aurelio Muttoni, Full Professor, EPFL Lausanne

Giovanni Plizzari, Full Professor, University of Brescia

Walter Salvatore, Full Professor, University of Pisa

Khaled Sennah, Full Professor, Toronto Metropolitan University (Canada)

Joost Walraven, Professor Emeritus, Delft University of Technology, Former President of *fib*

## LOCATION

Room B.0.3 (ground floor) - via Branze 43

## COURSE SCHEDULE

### Monday July 4, 2022

8.30 – 9.00: Registration

9.00 – 10.45 F. Minelli: *Guidelines for risk classification and management, safety assessment and monitoring of existing bridges. Experiences in Northern Italy*

11.00 – 13.00 M. Di Prisco: *The bridges in Italy: state of the art, case studies, research in progress and rational approaches to select intervention priorities*

14.00 – 15.30 H. Corres: *Sustainability in existing bridges: value of the interventions*

15.45 – 17.00 H. Corres: *Interventions in existing bridges and buildings. Case studies: Rande cable and Alcoi cable*

### Tuesday July 5, 2022

9.00 – 13.00 H. Corres: *Suspension bridge in Santos, Brazil: main cable replacement and repair.*

*Colon Towers, Madrid: architectural adaptation, increase in the number of floors and structural rehabilitation*

14.00 – 17.00 Technical visit

### Wednesday July 6, 2022

9.00 – 13.00 A. Muttoni: *Case studies of assessment and interventions on bridges*

14.00–17.00 J. Walraven: *Assessing the bearing capacity of existing bridges and need for strengthening*

### Thursday July 7, 2022

9.00 – 13.00 J. Walraven: *Strengthening measures for different types of bridges*

14.00–17.00 R. Masmoudi and K. Sennah: *Strengthening bridges with FRP*

### Friday July 8, 2022

9.00–10.45 W. Salvatore: *Advanced inspections in critical post-tensioned bridges*

11.00 – 13.00 G. Plizzari: *Strengthening of existing bridges by means of UHPFRC: case studies*

### Seminario in italiano per professionisti (3CFP)

Sala Consiliare - via Branze 38

14.00 – 17.30 *La gestione dei ponti esistenti a valle della pubblicazione delle recenti Linee Guida: il caso della Provincia di Brescia*

Il seminario è organizzato dall'Ordine degli Ingegneri della Provincia di Brescia in collaborazione con DICATAM e Provincia di Brescia.

Relatori:

Avv. Massimo Vizzardi, Provincia di Brescia

Prof. Ezio Giuriani, Università degli Studi di Brescia

Prof. Fausto Minelli, Università degli Studi di Brescia

Ing. Luca Facconi, Università degli Studi di Brescia

Ing. Nico Di Stefano, Università degli Studi di Brescia

Ing. Enrico Faccin, Università degli Studi di Brescia

Ing. Stefano G. Mantelli, Università degli Studi di Brescia