Sustainable Construction with Bio-Composite Materials (BIO-FIBRE) KA220-HED-2022-003

Luisa Molari

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Erasmus+ Project

- Actions:
  - Key Action 1: Learning mobility of individuals
  - Key Action 2: Cooperation among organizations and institutions:
    - Partnerships for Cooperation
    - Partnerships for Excellence
    - Partnerships for Innovation
    - Capacity building in the field of higher education, variational education and training
  - Key Action 3: Support to policy development and cooperation

Progetto ERASMUS + Sustainable Construction with Bio-Composite Materials (BIO-FIBRE)

KA220-HED-2022-003

- 7 Università coinvolte:
  - VIA University College, Aarhus, Denmark;
  - Alma Mater Studiorum - Università di Bologna, Bologna, Italia;
  - Aristotle University of Thessaloniki, Thessaloniki, Greece;
  - Universidade Nova de Lisboa, Lisbon, Portugal;
  - Technische Unirsiteit Enidhoven, Eindhoven, The Netherland;
  - Universitat Politecnicade Catalunya, Barcelona, Spain;
  - Vilniaus Gedimino Technikos Universitetas, Vilnius, Lituania.

Aim of the project

- Develop the new course "**Green Construction with Bio-Composite Materials**" dedicated to 3–4th year BSc students and MSc students, studying **architecture, architectural technology, civil engineering, construction technology or similar study programmes**.

- 4 students of the each Institution will be involved

Course on ‘Green Construction with Bio-Composite Materials’

- Online Lectures from the last week of September 2024 to the first week of March 2025
- Two presential weeks:

  14-18 October 2024 Thessaloniki, Greece

  10-14 March 2025 Eindhoven, The Netherlands
- Learning materials available online

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Lectures

- Introduction to the project VIA UC 45’ 25 sept 2024
- What is a bicomposite and its major challanges: sustainability, mechanical properties, barriers,.. UPC 2 oct 2024
- Intro to "Matching specs with new applications’ VIA UC 45’ 9 Oct 2024
- 14/18 OCTOBER Presential course AUTH - GREECE

	Sustanability				
7	Sustainable construction principles	Laura Tupenaite, Loreta Kanapeckiene	VILTECH	45'	23 oct
8	Circular Economy in Construction	Laura Tupenaite, Loreta Kanapeckiene	VILTECH	45'	30 oct
	Row Materials/ characterization of row material				
9	Characterization of bio-fibres	Kamperidou Vasiliki/GONCALVES	AUTH	45'	13-nov
	Composite materials				
	Mechanical properties of composite				
10	Fiber reinforcement	Maria Stefanidou	AUTH	45'	20-nov
11	Composite materials: theory and models	Luisa Molari	UNIBO	45'	27-nov
	Hygrothermal properties				
12	Igrothermal properties in biocomposite material: experiments and modelling	Luis Baltazar	NOVA	45'	4 dec
	Durability				
13	Durability in biocomposite materals	Stefania Manzi	UNIBO	45'	11 dec
14	Fire Properties	Laia	UPC	45'	18 dec
15	VIA research knowledge sharing		VIA	45'	8 jan

19 march

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	Applications				
16	Bio-fibres in architecture	Cruz	NOVA	45'	15 jan
17	Innovative application of biocomposite	Florent/Sandra	Tue	45'	22 jan
18	Challenges for biocomposite	Florent Gauvin	Tue	45'	29 jan
19	Wood-based composites	Tomas Gecys, Laura Tupenaite	VILTECH	45'	05-feb
20	Mineral claddings with bio-fibres: design of the layers according to the desired properties	Amanda/Antonia	UPC	45'	12-feb
21	ReedCob - A building technology with earth and Arundo donax	FARIA	NOVA	45'	19-feb
22	Partcleboards with biofibres: some examples	Molari	UNIBO	45'	26-feb
23	3D printing clay mortar	Costadina	AUTH		5 march
24	Matching specs with new applications	RAMR	VIA	45'	6 march

10/14 MARCH Presential course Tue - THE NETHERLANDS

Implemenation analysis - Identifying opsticals and references 19 nov 2024
Final discussion

14/18 OCTOBER Presential course AUTH - GREEC

Monday 14/10	Tuesday 15/10	Wednesday16/10	Thursday17/10	Friday18/10
Morning session				
10:00 Welcome-introduction	9:15 Lab session	9:15 Lab session	10:00 Lab session	9:15 Lab session
11:00-13:00 Theory 1 (materials properties, tests performed)	Preparation of the compositions	1-d Strength	Testing different fibres (Absorption, strength)	3-d strength, porosity, capillarity
Afternoon session				
3:30 Presentation of the participants	Preparation of the compositions	Lab session - elaboration the results	Lab session-Elaboration the results	Elaborating the results
4:30 Laboratory (introduction)	Theory2	Theory 3	Theory 4	Presentations

3	Producing and testing biocomposite	Maria Stefanidou	AUTH		14 oct
4	BPL related		VIA UC		16 oct
5	Inorganic and organic matrices	Laia/Paulina	NOVA/UPC	45	06-nov
6	Additive manufacturing	Sandra Lucas	TUE		17 oct

10/14 MARCH Presential course Tue - THE NETHERLANDS

	Monday	Tuesday	Wednesday	Thursday	Friday
Morning	Visit of the university Lecture about biobased/3DPC	3DPC workshop part 1	Mechanical properties: Fresh state/rheology	Aternative biobased (insulation) and physical characterization	Microstructural characterization
Afternoon	Visit the labs Safety instructions Short lecture about asssignments	3DPC workshop part 2	Mechanical properties: comparison samples casted Greece vs 3DP	No lab activity/Redaction/Assessment of results	Student presentations Short conclusion lecture
Lab activity A	Alternative biobased (e.g. mycelium, cork, hempcrete) observation: Physical properties measurements				
Lab activity B	3DPC workshop: Extrusion with auto-caulking gun				
Lab activity C	Fresh state measurement and rheology study				
Lab activity D	Mechanical properties analysis: comparison samples casted in Greece vs 3DP samples				

Reclutamento UNIBO

Verranno scelti **4 studenti dell'Università di Bologna** iscritti alle lauree **magistrali in Ingegneria Civile, Civil Engineering, Ingegneria edile, Architettura** (e corsi di studio simili) o studenti iscritti al terzo anno delle lauree triennali sugli stessi temi.

Per i 4 studenti selezionati il progetto prevede **un rimborso delle spese di viaggio e di permanenza all'estero** durante i due corsi in presenza pari a **250 euro per il viaggio e 70 euro giornalieri per i giorni di permanenza al corso.**

La frequenza alle lezioni online e in presenza è obbligatoria ai fini del riconoscimento dell'attività formativa.

Gli studenti interessati dovranno inviare la propria candidatura agli indirizzi email: luisa.molari@unibo.it e stefania.manzi4@unibo.it entro il 10 giugno 2024 alle ore 17, indicando il Corso di studio di afferenza e allegando il proprio CV (con crediti acquisiti e media).

Per informazioni si può consultare il sito del progetto: https://sites.google.com/view/bio-fibre/home