



ALL.3) INTENSIVE COURSE TRAINING ACTIVITIES PLAN (SUMMER SCHOOL):

**ONLINE BIM AND GIS FOR DIGITAL INTEGRATED DESIGN
31 AUGUST – 11 SEPTEMBER 2020**

Department of Planning, Design, Technology of Architecture

Course type	Summer School
Name	<i>BIM and GIS for digital integrated design</i>
Proposing department	Department of Planning, Design, Technology of Architecture
Course Director	MARCO CASINI
Minimum and maximum number of admissions	MIN-MAX: 20-60
Admission requirements	First level degree or equivalent.
Training objectives of the Course	The Summer School aims to create a training course focused on the acquisition of knowledge about the opportunities, principles and advantages related to the management and organization of workflows based on ICT, with particular regard to BIM AND GIS integrated methodologies, allowing the process development in a digital scenario. Methodological solutions and <i>age-friendly</i> approaches related to the built environment will also be explored.
Expected learning outcomes	Ability to operate within an integrated BIM AND GIS process, critical ability in the approach to the multidisciplinary process, good ability to manage BIM models and the interaction with GIS, acquisition of modeling skills focusing on the construction process management, principles and applications of integrated management and project development with an <i>age-friendly</i> approach.



**Online Summer School Training Activities Plan:
BIM AND GIS for digital integrated design**

Denominazione attività formativa Name of training activity	Responsabile insegnamento Responsible for teaching	Ore Hours	Tipologia Type	Lingua Lang.	CFU ECTS
<p>MODULO 1 Organizzazione e digitalizzazione delle informazioni relative all'edilizia e alle opere di ingegneria civile, incluso il Building Information Modelling (BIM) – Gestione informativa mediante il Building Information Modelling Concetti e principi Fase di consegna dei cespiti immobili Piattaformizzazione del settore costruzioni</p> <p>MODULE 1 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) Concepts and principles Delivery phase of the assets Platformization of AEC Industry</p>	<p>Prof. Francesco Ruperto</p>	<p>6</p>	<p>Didattica frontale Lectures</p>	<p>Inglese English</p>	<p>1</p>
<p>MODULO 2: La gestione integrata dei processi sostenibili di riqualificazione e recupero del patrimonio architettonico e ambientale.</p> <p>MODULE ENGLISH TEXT The integrated management of sustainable processes of requalification and recovery in the architectural and environmental heritage. Purpose of the activity is to learn what are the methods and tools to investigate and learn about historical architecture and subsequently organize the data for different types of processing: on one hand the use of ICT to communicate historical and cultural heritage; on the other hand, the use of HBIM to preserve and reuse existing buildings and areas.</p>	<p>Prof. Tommaso Empler</p>	<p>6</p>	<p>Didattica frontale Lectures</p>	<p>Inglese English</p>	<p>1</p>

<p>MODULE 3: Sistemi di gestione digitale del territorio (Geographic Information Systems) e integrazione con metodologie BIM.</p> <p>GIS and its integration with BIM methodologies. Geographic Information Systems and its integration with BIM methodologies. Why to integrate GIS with the BIM methodologies, tools and procedures? Beyond the 3D modelling: geography and GIS multi-thematic environment, additional dimensions of BIM data. City Information Models (CIM) to build and manage scenarios of the Smart City; Digital Twins and Big Data for cities and territories. Some GIS-BIM applications: complex asset management; design and maintenance process for linear infrastructures; tri-dimensional cadastre. Introduction to GIS, to relational DBMS, to Geo-Data; relations among concepts as Scale, Informative details and domains, LOD; Attributes and classifications from thematic overlay to BIM categories. Some operations in GIS-BIM integrated environment:</p> <ul style="list-style-type: none"> • BIM feeding GIS Data through aggregation and summarize; • GIS feeding BIM for new buildings context aware data <p>Which models for GIS and BIM interoperability; 3D modeling in GIS environment; Cartographic models in BIM environment; Standardisation of data structures and interchange formats: sharing and integrated management of spatial data through the Common Data Environment (CDE).</p>	Ing. Patrick Maurelli	6	Didattica frontale Lectures	Inglese English	1
<p>MODULO 4a: Metodi e strumenti digitali nel processo costruttivo mirati alla gestione e alla realizzazione dell'opera.</p> <p>MODULE 4a: Digital methods and tools in the construction process for an efficient project management workflow: case histories</p> <p>The activity provides an analysis of methods and applications related to the use of digital methods and tools for the control and optimization of different phases in the</p>	Prof. Sofia Agostinelli	6	Didattica frontale Lectures	Inglese English	1

<p>construction process.</p> <p>The opportunities deriving from the integration of information systems in the project workflow will be explored also through the analysis of specific thematic case studies about the interaction of Digital Twins & Artificial Intelligence systems aimed at optimizing processes.</p>					
<p>MODULO 4b: Analisi di modelli integrati e presentazione di precisi casi di studio applicativi nell'ambito dell'approccio digitale alle diverse scale e fasi del processo.</p> <p>MODULE 4b: Analysis of integrated models and applicative case studies within the digital approach for planning and programming the activities through the process phases.</p> <p>The activity explores the theoretical and applicative aspects of an integrated 4D/5D project planning coming from the analysis of a 3D model, then proceeding to the realization of a 5D model up to the different levels of a 4D programming. The approach also involves the description of different planning techniques both in the design and construction phases.</p>	Dott. Stefano Amista	8	Didattica frontale Lectures	Inglese English	1
<p>MODULE 5: - Performance analysis and optimization design of green buildings driven by digital technology (BIM, Rhino, etc.): lectures and hands-on exercises - Algorithms and how they change the architectural design: lectures - Sustainable urban design in the digital era: lectures - Green practices in China's building industry: lectures</p>	Prof. Xing Shi, College of Architecture and Urban Planning, Tongji University	6	Lectures, case studies, and Chinese practices	English	1
<p>PROVA FINALE Attività di apprendimento individuale con produzione e verifica di un elaborato finale. Relazione finale per gruppi di lavoro da discutere in specifico workshop con il corpo docente della ISS.</p> <p>FINAL TEST Final report for work groups to discuss in specific workshops with the teaching staff of the ISS.</p>	Prof. Fabrizio Cumo Prof. Flavio Rosa	2	Verifica dell'apprendimento individuale Individual learning check	Inglese English	
<p>Altre attività</p> <p>Other Activities</p>	Non previste Not expected	--	--	--	

CFU Crediti Formativi Universitari – European Credit Transfer and Accumulation Systems					6
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Start of lessons	31/08/2020
Delivery language	English
Assigned CFU	6 ECTS-CFU
Sapienza Professors responsible for the teachings and their short curricula	<p>Prof. Marco Casini</p> <p>Prof. Marco Casini is a leading academic in the Green and Smart Building sector with over 20 years experience in Building Sciences. He is an environmental engineer, PhD in Environmental Engineering and Research Fellow in Architecture Technology. Since 2002 he has been Professor of Architecture Technology and of Environmental Certification of Buildings at the Faculty of Architecture of Sapienza University where he also teaches in several Master's, PhD and Graduate schools on subjects pertaining to Energy and Environmental Sustainability for Buildings.</p> <p>Prof. Tommaso Empler</p> <p>Since 1998 lecturer in Automatic Drawing at Sapienza University of Rome, Faculty of Architecture; Researcher since 2010 at the same Faculty; since 2012 Head of the training course in Computer Graphics 2D and 3D with free software; head of the training course in Interaction and Multimedial Experience; teacher of the BIM Master and member of the Scientific Teaching Council.</p>
Frequency modes of educational activities	The attendance of at least 75% of the activities entitles the student to a certificate of attendance.
Location	Online: ZOOM platform with simultaneous interpretation in different languages
Stage	unscheduled
Registration fee	300 € excluding board and lodging
Any partial or total exemption fees from the payment of the Department's portion of the fee expressed as a percentage.	40 % discount for Ph D students Sapienza

THE HEAD OF THE DEPARTMENT CONCERNED