

Department of Civil and Environmental Engineering, Carleton
University

**CIVE5603/BLDG5201: ADVANCED BUILDING
CHARACTERIZATION, CONSERVATION AND REHABILITATION**

COURSE SYLLABUS – FALL 2024

INSTRUCTOR: Dr. **Mario Santana Quintero**, Professor
mario.santana@carleton.ca
613-520-2600 x7468 – Office x 3093,
Office: Canal Building, Office 5207 (5th floor)
Lab: Carleton Immersive Media Studio (CIMS)
Visualization & Simulation (VSIM) Building, 4th floor

CLASS LECTURES: Wednesday 2:35 pm to 5:25 pm

Course description

This course will provide graduate students with an understanding of the fundamental concepts and techniques for the identification, documentation and conservation of heritage buildings and existing buildings. The course includes lectures and workshops by experts representing the key disciplines and practice areas involved in heritage conservation and documentation.

The course comprises three hours per week of lectures, plus additional activities assigned by the course instructor.

At the completion of the course, the student will be able to:

- Discuss and show the fundamental concepts involved in the identification and conservation of heritage places in Canada and internationally;
- Describe digital workflows for identifying, recording, modelling, assessing, analyzing and interpreting existing buildings and sites;
- Explain and adopt ethical obligations when applying digital tools to capture and disseminate information about heritage sites;
- Use and conduct research to identify heritage values and attributes of buildings and sites;
- Use and conduct techniques for recording and modelling existing buildings and sites;
- Use and conduct techniques for energy modelling;
- Use and conduct research on construction materials, assemblies and building envelopes for rehabilitation and preventative maintenance purposes;
- Describe the role of monitoring systems in improving the maintenance and care of existing buildings;
- Describe and apply heritage conservation approaches such as heritage impact assessments and conservation plans;

- Explain the roles of different disciplines, government authorities and organizations in heritage conservation and rehabilitation; and
- Explain and apply ethical principles in heritage decision making

Prerequisites: open to all graduate students with a particular interest in heritage buildings.

Biographical sketch of instructor

Mario Santana-Quintero, is a full professor at department of Civil and Environmental Engineering Carleton University. He is also a guest professor at the Raymond Lemaire International Centre for Conservation (University of Leuven). Along with his academic activities, he served as Secretary General of the International Council of Monuments and Sites (ICOMOS) and he is the Honorary president of the ICOMOS Scientific Committee on Heritage Documentation (CIPA). Furthermore, he has been a Getty Conservation Institute scholar, and he collaborated on several international projects in the field of heritage documentation for The Getty Conservation Institute, UNESCO, Bahrain Authority for Culture and Antiquities, ICCROM, World Monuments Fund, UNDP, Welfare Association, and the Department of Culture and Tourism of Abu Dhabi.

Evaluation

Assignment 1 (Selection of a Site)	5%
Assignments 2 through 4 (worth 10 % each)	30%
Group Project	45%
Course compliance: students are expected to participate in lectures and class discussions. Absences will generally be excused only for emergencies or remote access issues. Also, this includes successfully using the software provided for class. Important: here you are acknowledging that the course outline has been read and understood.	20%

Course Materials

All relevant course materials including lecture videos, notes, readings, and other resources, will be posted to Brightspace.

Students should download “Standards and Guidelines for the Conservation of Historic Places in Canada” from the Canada’s Historic Places website: <https://www.historicplaces.ca/en/pages/standards-normes>

Assignments

Five assignments and one group project will be given throughout the term. They will be posted a minimum of two weeks before they are due. Refer to course schedule on Brightspace for deadlines.

Late assignments might be accepted but with a 10% per-day mark reduction with permission of the instructor. Assignments are to be completed individually; evidence of direct copying will be treated as cheating and will be handled accordingly (i.e., reported to the Dean's office).

Attendance and participation

Students are required to attend all activities. **Attendance at at least 70% of the course activities is required to pass.** Success in the course depends upon participation in course activities, class discussions, and completion of readings. Absences will generally be excused only for emergencies or justified reasons.

For class Schedule – download from Brightspace

Exams

There are no exams in this course.

Software

Students may need to download the following software to complete the course project:

- Reality Capture (Epic Games) <https://www.capturingreality.com>
- Agisoft Metashape PRO (photogrammetry, 30-day free licenses available) - <https://www.agisoft.com/downloads/installer/>
- Smartphone's apps, such as RealityScan or LUMA AI
- Autodesk AutoCAD (student licenses available)
- Autodesk Recap (student licenses available)
- A simulation software of their choice to complete the course project

Communication

The primary means of communication with the course instructor. There will be no dedicated office hours. Virtual or in-person meetings with the course instructor can be scheduled upon request.

Intellectual property, copyright and fair dealings

As a condition of participating in the course and for academic evaluation, students will be required to upload in-progress and completed work to the instructor's desired online platform(s). It is expressly understood that any such records or copies of student work will be used for nonprofit presentation, and for the purposes of this authorization, the nonprofit exhibition includes showing, screening, publication and releases or expression as a public service by internet distribution, commercial broadcasting or publication in furtherance of course specific and institutional learning objectives.

For intellectual property and copyright reasons, please under no circumstances download course documents or presentations for distribution without first acquiring the written permission of the author/instructor.

Plagiarism

The University Academic Integrity Policy defines plagiarism as “presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.” This includes reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT);
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own; and
- failing to acknowledge sources through the use of proper citations when using another’s work and/or failing to use quotations marks.

Plagiarism is a serious offence that cannot be resolved directly by the course’s instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of “F” for the course.

Learning and Working Environment

The University and all members of the University community share responsibility for ensuring that the University’s educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please contact the [Department of Equity and Inclusive Communities](#) at equity@carleton.ca

We will strive to create an environment of mutual respect for all through equity, diversity, and inclusion within this course. The space which we work in will be safe for everyone. Please be considerate of everyone’s personal beliefs, choices, and opinions.

Academic accommodations

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at **613-520-6608** or pmc@carleton.ca.

You should request your academic accommodations in the [Ventus Student Portal](#), for each course at the beginning of every term. For in-term tests or midterms, please request accommodations at least two (2) weeks before the first test or midterm. Please consult the [PMC website](#) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Accommodation for Student Activities: Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the [Senate Policy on Accommodation for Student Activities \(PDF\)](#).

Pregnancy Obligation: Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the [Student Guide to Academic Accommodation \(PDF\)](#).

Religious Obligation: Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the [Student Guide to Academic Accommodation \(PDF\)](#).

Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit the [Sexual Violence Prevention & Survivor Support](#).

Self-Declaration form and deferred term work

Students who claim illness, injury or other extraordinary circumstances beyond their control as a reason for missed term work are held responsible for immediately informing the instructor concerned and for making alternate arrangements with the instructor and in all cases. This must occur no later than three (3) days after the term work was due. The alternate arrangement must be made before the last day of classes in the term as published in the academic schedule. Consult [Section 4.4 of the University Calendar](#) .

Student Mental Health and Wellness

As a university student you may experience a range of mental health challenges that can significantly impact your academic success and overall well-being. Carleton's [Wellness Services Navigator](#) is designed to help students connect with mental health and wellness resources.

If you need to talk to someone from the department for more information and support with connecting to resources, you can contact the following faculty members, depending on your program. Or contact the department at orCEEUGChair@cunet.carleton.ca.

Here is a list of on-campus and off-campus recourses:

1. **Carleton's Health and Counselling Services:** To book an appointment contact the main clinic by calling (613) 520-6674. If urgent, let the Patient Care Coordinator know or go in person to the main clinic (2500 Carleton Technology and Training Centre Building) and indicate that they are in crisis and need to speak to someone right away. For more information, please see <https://carleton.ca/health/>
2. [Emergencies and Crisis](#) and [Emergency Numbers](#)
3. **Good2Talk (1-866-925-5454):** Good2Talk is a free, confidential helpline providing professional counselling and information and referrals for mental health, addictions and well-being to post-secondary students in Ontario, 24/7/36 <https://good2talk.ca/>
4. **Empower Me:** Undergraduate students have access to free counselling services in the community through Empower Me, either in person, by telephone, video-counselling or e-counselling. **This free service is accessible 24/7, 365 days per year.** Call **1-844-741-6389 (toll free)** to make an appointment with a counsellor in the community. More information is available <https://students.carleton.ca/services/empower-me-counselling-services/>
5. **The Walk-In Counselling Clinic (off-campus community resource):** The walk-in Counselling Clinic have offices in various locations across Ottawa and the greater Champlain region that are open 7 days a week. Individuals will be assisted, with no appointment, on a first-come, first-serve basis during the Walk-in Counselling Clinic hours. The Walk-in Counselling Clinic **offers services in many languages** and is free and confidential. More information can be found at: <https://walkincounselling.com/>

6. **Distress Centre of Ottawa and Region:** Available 10am-11pm, 7 days/week, 365 days/year. **Distress Line:** 613-238-3311, **Crisis Line:** 613-722-6914 or 1-866-996-0991, **Text:** 343-306-5550. <https://www.dcottawa.on.ca/>
7. **Distress and Crisis Ontario, Available for chat 2 pm – 2 am EST.** <https://www.dcontario.org/>
8. **BounceBack Ontario (Toll-Free: 1-866-345-0224)** is a free skill-building program managed by the Canadian Mental Health Association (CMHA). It is designed to help adults and youth 15+ manage low mood, mild to moderate depression and anxiety, stress or worry. Delivered over the phone with a coach and through online videos, you will get access to tools that will support you on your path to mental wellness. <https://bouncebackontario.ca/>.

Accessibility

Students with disabilities requiring academic accommodation in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Documented disabilities could include but are not limited to mobility/physical impairments, specific Learning Disabilities (LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and chronic medical conditions. Registered PMC students are required to contact the PMC, 613-520-6608 every term to ensure that instructor receives your Letter of Accommodation no later than two weeks before the first assignment is due or the first-in-class test/midterm requiring accommodations. If you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by the deadlines published on the PMC website:

- <https://carleton.ca/pmc/>
- <https://carleton.ca/registrar/registration/dates-and-deadlines/>

Student conduct

Please refer to <https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/> for specific information regarding Student Conduct and Academic Integrity standards.

Student responsibility

<https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/student-responsibility/>

Conduct discrimination and harassment

<https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/academic-integrity-and-offenses-of-conduct/>

Academic integrity

The University has adopted a policy to deal with allegations of academic misconduct. This policy is expressed in the document Carleton University Academic Integrity Policy, found here:

<https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/academic-integrity-and-offenses-of-conduct/>

Security and safety

Avoid Working Alone After Hours · In Case of Emergency, Dial Extension 4444 from any campus phone.

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CLASS SCHEDULE – FALL 2024

	Week	Session	Topics	Assignments
1	Sept 4	Course Introduction	Introduction Outline Sites	
2	Sept 11	Conservation of Historic Places	Recognizing Existing and Historic Buildings UNESCO World Heritage Convention	A02: Applying Standards and Guidelines Introduced Group Project Introduced
3	Sept 18	Recording Historic Places	Digital Photogrammetry 3D Scanning Processing digital assets for Historic Places	A03: Recording a Historic Place introduced
4	Sept 25	Recording Historic Places	Digital Photography (Guest Lecture TBC)	
5	Oct 2	Condition Assessment of Historic Places	Materials Deterioration Performance	A04: Condition Assessment of a Historic Place introduced
6	Oct 9	Presenting Historic Places and Modeling Historic Places	Interpretation and presentation of Historic Places Open Source applications for Building Assessments and Digital Twins (Nicolas Arellano)	

7	Oct 16	Computational modeling of Historic Places	Graduate research seminar 1: Digital heritage Recording workflow (Guest Lecture TBC) Computational Modeling in Conservation Engineering (Guest Lecture TBC)	A02: Standards and Guidelines due
8	Oct 23			
8	Oct 30	Best Practices	Site Visit	
9	Nov 6	Best Practices	Conservation of Historic Places Digitally Assisted Storytelling of Historic Buildings (Guest Lecture TBC)	A03: Recording a Historic Place due
10	Nov 13	Project Management of Historic Places	Preparation of a Conservation Plan Project Management (Guest Lecture TBC)	A04: Presenting a Historic Place introduced A03: Condition Assessment of a Historic Place due
11	Nov 20	Best Practices	Conservation of Historic Places	
12	Nov 27	Closing	Key Messages Tutorial on how to upload Course Report dataset on dataverse	
13	Dec 4	Presentations	Student presentations and course feedback	<u>Dec 3 – presentations are due</u>
	Dec 11			Course Project due A04: Presenting a Historic Place due