UW ARCHITECTURE →

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Design Computing Certificate

The Design Computing Certificate recognizes M Arch students who devote a significant portion of their studies to computational techniques in architectural design. This certificate recognizes their advanced knowledge and skills and provides preparation for leadership positions at the intersection of architectural design and information technology. Students wishing to pursue this field in greater depth should consider applying to the Design Technology stream of the Department's Master of Science in Architecture program.

CERTIFICATE REQUIREMENTS

The certificate can be completed within the accredited Master of Architecture (M Arch) program through **12 credits** of coursework taken among the selective courses listed below. In addition, the student must integrate related research within their Master's Thesis or in either ARCH 507 or ARCH 508 Research studio.

To receive certificate recognition students must fill out a Certificate Completion Form prior to graduation. Check with the Graduate Program Advisor for deadlines.

SELECTIVE COURSES

ARCH 527: Intro to Digital Design & Fabrication (3)
Fundamentals of digital fabrication technologies and related software, with special attention to requirements and opportunities for craft and design expression.

ARCH 528: Digital Design for Fabrication and Construction (3)
This course pays particular attention to digital design systems and the development of parameterized models and their subsequent fabrication or construction.

ARCH 529: Advanced Digital Projects (3)
Advanced projects in digital design and fabrication for students who have completed the introductory fabrication courses and wish to develop a project further.

ARCH 582: Computational Lighting Design (3)
Computational Lighting Design draws from recent developments in lighting simulation, visualization, per-pixel data measurement, and analysis techniques. Students study existing environments with a computational photography technique and utilize advanced simulation tools to integrate lighting analysis into the architectural design processed.

ARCH 586: Computation and Design Technology (3)
The course explores the relationship between design technology and computational methods. The course discusses how information technologies carry implications and opportunities in the design process, representation, and end products. The course makes use of the python programming language and the Rhinoceros CAD environment as an introduction into basic computational methods, making direct parallels between theoretical topics, research methods and design process.

ARCH 598: Augmented Intelligence and Sustainable Design (3)
This course explores the theoretical context and various technologies and techniques involved with the data-driven and physics-based simulation methodologies for designing sustainable built environments. The course introduces how emerging digital technologies and leveraging artificial intelligence (AI) and machine learning (ML) present opportunities to enhance performance simulation workflows and inform decision-making processes. With an emphasis on urban building energy modeling (UBEM), this course enables multi-scale exploration of energy flows essential to support carbon reduction targets.

ARCH 598: Computational Design (3)
This course is a deep dive into state-of-the-art computational methods for architectural design, including parametric modeling, data structures and performance-oriented design. The course makes use of the Rhinoceros CAD environment as well as the Python programming language to introduce these concepts, and basic programming methods.

ARCH 598: Energy Simulation: Tools and Methods for Sustainable Design (3) This course introduces a methodology for incorporating detailed parametric energy simulation and climate analysis tools early in the design process for reduced operational energy and improved human health and comfort. Students will learn the fundamentals of creating and running a multi-zone energy model using Rhino and open sources tools including: Grasshopper, Ladybug, OpenStudio, and EnergyPlus.

ARCH 598: Performance-Driven Design (3) As contemporary modeling tools allow architects greater flexibility and accessibility to explore design iterations, there are increasing opportunities to utilize them beyond generating visually compelling forms through parametric modeling. In early and developmental phases of design, performance-based approaches provide opportunities to inform geometric

decisions that are inherently in flux. This class explores parametric modeling (Rhino Grasshopper) techniques in combination with building performance simulation tools.

FREQUENTLY ASKED QUESTIONS

Can I combine this with M Arch degree options or other certificate programs? Yes. As long as your coursework satisfies the requirements for the Design Computing Certificate, and you integrate related research in your thesis or one of your research studios, one may simultaneously satisfy multiple certificates but check with each certificate adviser to confirm limitations on the share of credits.

Does the certificate appear on my UW transcript? No. However, many employers recognize the value of the skills covered by the certificate when included on your résumé, and the department records certificate holders on its website.

Can an undergraduate earn the certificate? This is a certificate in the M Arch program only.

Is this certificate open to non-matriculated students? No, only students pursuing a Master of Architecture degree may pursue this certificate.

Is the certificate the same as the Master of Science (MS) in Design Technology? No. The MS in Architecture program in Design Computing is a 5-6 quarter advanced study option that includes many of these same courses but offers greater depth. Would getting the certificate while an M Arch student shorten the time spent in the MS program? Maybe. The university permits up to 9 credits to be shared between the M Arch & MS Arch programs. Speak with the department's academic adviser.

What about independent study and Special Topics courses? Contact the certificate program coordinator to find out if a particular ARCH 598-Special Topics, or ARCH 600 Independent Study will count towards the certificate

What steps are required before I begin pursuing this Certificate? 1) Complete the online registration form https://catalyst.uw.edu/webq/survey/claudine/383525; and 2) contact the Certificate Program Coordinator.

CONTACTS FOR QUESTIONS:

Certificate Program Coordinator:
Mehlika Inanici, inanici@uw.edu

Master of Architecture Academic Adviser:
Claudine Manio, claudine@uw.edu

DESIGN COMPUTING CERTIFICATE CHECKLIST

Submit form to academic adviser by Week 5 of your graduation quarter

Student Name: _____ Graduation Quarter/Year: _____

Identify the 12 credits of relevant coursework	**Quarter/Year**	**Grade**
ARCH 527: Intro to Digital Design & Fabrication		
ARCH 528: Digital Design for Fabrication + Construction		
ARCH 529: Advanced Digital Projects		
ARCH 586: Computation and Design Technology		
ARCH 582: Computational Lighting Design		
ARCH 598: Augmented Intelligence and Sustainable Design		
ARCH 598: Computational Design		
ARCH 598: Energy Simulation: Tools and Methods for Sustainable Design		
ARCH 598: Performance-Driven Design		

Integration of related research completed in (select course):	**Quarter/Year**	**Grade**
___ARCH 507 Research Studio I ___ARCH 508 Research Studio II ___ARCH 700 Master's Thesis		
Please provide a summary of the design computing research completed in above course:		

Type Name of Studio Instructor or Thesis Chair: _____

Signature of Instructor or Thesis Chair – attests that related research was integrated Date:

_____ _____