WASTE +1: UNWANTED WOOD
MIT 4.154 Spring 2026 ODDS & MODS Studio
TUES/THURS: 1:00 PM – 5:00 PM

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STUDIO SUBJECT DESCRIPTION
WASTE +1: UNWANTED WOOD is the third curriculum of the ODDS & MODS research and design initiative on material circularity in architecture. With a different material focus each year, ODDS & MODS seeks to create new architectural possibilities through the reuse and upcycling of geometrically variable natural materials and diverse materials harvested from factory 'waste' streams. This Spring, we explore what is termed **UNWANTED WOOD.** This encompasses the enormous scale of wood construction waste and "low value" timber such as small diameter hardwoods, invasive species and "unmerchantable" trees that, if removed from forests, would improve forest health and resiliency. Students will engage the field of Discard Studies to question what wood "waste" might mean and stake out positions that redefine structural and spatial material value in larger cultural, economic and disciplinary contexts. Departing from Odds & Mods mono-material research, we invite students in **WASTE +1** to bring a guest material, a plus one to their design work with unwanted wood.

In the first part of the semester, Studio will visit and research the deciduous forests of New England. Students will learn from worked precedents, engaging the rich history of structures that use many lightweight or densely joined members. Students will conduct research though design in digital and physical models, while building knowledge on unwanted wood in New England through hands-on work in the adjacent Workshop (MIT 4.185).

The Studio will leverage MIT's Circularity Toolkit and computational design to explore a fuzzy architectural form making that can accommodate varying inventories of waste wood. Our approach moves away from the traditional value accorded to physically continuous, uniformly milled wood in favor of a transformative 'alchemy' where diverse small wood pieces, considered in the mainstream as 'waste', can be aggregated and designed to take on higher value spatial and structural capacities. The irregular and unpredictable dimensions of unwanted wood offer a spatial experience that contrasts with the uninterrupted 'clean' 'blank' aesthetic of cross laminated timber (CLT). Extracted as commercial crop in industrially cultivated forests, contemporary CLT production perpetuates modern era systems of standardization and modular pre-fabrication that create significant material waste. On the other end of the industrial-forest spectrum, unwanted wood in forests encompasses invasive and small diameter mixed-tree species of varying forms. The diversity and natural variances of tree species and tree geometries prevent this unwanted wood from being harvested by mainstream sawmills which specialize in homogenous, single stream timber.

The WASTE +1 studio design project engages the structure, architecture and public image of unwanted wood. Students will select and source an inventory of unwanted wood and explore its behavior as a structural system of load paths, member sizes and connections. In parallel, students will develop design tools and skills to configure the architectural space that structure produces in section, with design investigations that explore the figuration of unwanted wood poche, its potential form as occupiable space, and its spatial hierarchies, density and distribution. In the second half of the semester, students will respond to unwanted wood from the Mediterranean forests in France. Students will fabricate prototypes and apply their findings to design a 15-meter clear-span multi-story of unwanted wood, scaled for collective programs of use that support bioregionalism in the Mediterranean Alpilles region of France. (See Design Challenges and Learning Objectives below).

The Odds & Mods Studio MIT 4.135 and Workshop MIT 4.185 are integrated to support student research and learning beyond MIT. **Field Trips in the Workshop will enable students** to meet and learn from sawyers, indigenous knowledge keepers, and foresters, and visit local manufacturers, wood salvage yards and wood waste re-cycling centers. **Studio students will travel to France** over Spring Break, visiting manufacturers and experts in wood craft in Grenoble and Arles. Working with unwanted wood in climate threatened Mediterranean forests, studio students will select project sites and present their design work and support regional efforts for the creation of community demonstration projects for unwanted wood.

STUDIO DESIGN CHALLENGES AND LEARNING OBJECTIVES

In this studio, we ask students to define and understand the sources, constraints, material 'ecosystem,' properties, and spatial/architectural potentials of unwanted wood, found in low-value tree species and wood construction waste. Our context will transition from the study and design of unwanted wood in the local New England context to an understanding of invasive and low-value tree species and wood construction waste in French context of Arles in the Provence-Alpes-Côte d'Azur (PACA) Mediterranean forest region of our studio design site. Students are asked to understand, model, and transform an existing known wood structural system to a 15-meter clear spanning system that utilizes waste wood, choosing mass or distributed members and one additional "guest material" from the local area.

We will embark on a computationally enabled design process that allows for 'fuzzy' design parametric exploration for varying inventory: what aspects of the proposed spanning structure must be held as constants, what aspects could change/adapt to accommodate varying unwanted wood inventories? This is aided by our studio transition from New England unwanted wood to PACA Unwanted Wood. Students will learn to use computational modeling tools for geometric representation, structural analysis, and inventory-constrained design and apply them in their design development process.

Students will demonstrate the unwanted wood spanning structure, adapted to a design for a 2-3 story pavilion in the context of several site options that will be defined in Arles, France. Students will identify, research, and develop design reasoning for a collective or community program for their spanning structure and pavilion. It is the studio's deliberate intention to simplify the program and the expression of program in the pavilion plan, and to enrich interest and complexity in building section. Program

options could include options such as a Salt Storage shed for salt workers in the Camargue, a Wildlife Observation Station, Community Workshop for bio-material production, a Shade Structure or Meeting Hall for initiatives in Griffeuille, an underserved neighborhood of Arles where demolition/construction is currently occurring. The medieval town of Boulbon in Provence (a 30min drive from Arles) has a current call for a wood building that will "valorize local wood," offering the possibility of a real project as an optional program and site.

In April, upon return from France, students will develop and iterate their architectural design concepts, through exploration of section and waste aesthetics, in elevation and public image, and interior character. Students will create assembly instructions, connections strategies, and key details, portions of which will be fabricated and prototyped in the workshop.

At the end of the semester, students will gain an in-depth understanding of the challenges and opportunities for circularity-driven architecture, from highly contextualized supply chain characterization to the adaptation of structural and spatial concepts to the specifics of available materials, to detailed design and fabrication process planning for highly specified and novel architectural assembly systems. They will also gain substantial experience with structurally driven spatial/formal exploration, balancing both analytical tools and conceptual technical understanding to advance architectural concepts.

ASSIGNMENTS AND KEY DATES

PROBLEM 1: SPAN, WORKED PRECEDENT AND TRANSFORMATION
This project asks students to choose an existing structural and architectural precedent built with wood covering long spans (15 to 20m), to study it carefully through 3D digital and physical modeling and analysis, and to then project a transformed version that carries forward the key structural and spatial principles and reimagines them in response to a specific unwanted wood inventory based in the New England region. This project will include tutorials from instructors on formal approaches to leveraging density and lightness, computational modeling tools for structural analysis and inventory matching, and regular desk crits and discussions on project iteration and development. Key dates are as follows:

- **Thursday, February 5**: Problem launched
- **Tuesday, February 24**: Studio Review 1 (pinup) of precedent analysis and proposed transformation, including specific unwanted wood selection, with deliverables including digital 3D model, structural force flow analysis, physical section model, and drawings/sketches/diagrams showing connection strategies, wood sourcing flows, and potential fabrication/manufacturing approaches.
- **Tuesday, March 10**: Studio Review 2 (mid-review), final presentation of SPAN proposal, demonstrating the concept with further iteration and design development. Deliverables include finalized digital 3D model, structural force flow analysis, interior and exterior perspective views to convey image and character, physical section model, and updated drawings and diagrams that demonstrate the proposed approach to material sourcing, construction details, and fabrication.

PROBLEM 2: UNWANTED WOOD STRUCTURES IN THE ARLES/PACA REGION

This project situates the students' previous proposals in the Provence-Alpes-Côte d'Azur (PACA) region of France. In this new and specific context, students will be challenged to create designs that engage the effects/realities of defective and discarded waste wood: D'effets, Défauts, Déchets, as said in French. The Studio will travel to Grenoble and Arles in France to visit and learn from manufacturers, wood recyclers wood craft experts. Both new material inventories of unwanted wood and site specifics will come into focus as drivers for design development, along with a more articulated pavilion program that provides a community support function (specifics to be determined by students) while maintaining the long-span typology previously explored. Students are encouraged to explore design interventions in section to support program space needs in a manner integrated with structural innovation and advancement. Key dates are as follows:

- **Thursday, March 12**: Problem launched
- **Tuesday, April 7**: Studio Review 3 (pinup)
- **Tuesday, April 28**: Studio Review 4 (pinup)
- **Tuesday, May 12** (to be confirmed): Studio Final Review

STUDIO CULTURE

Our studio intends to support a positive and respectful environment for critical thinking and innovation in material circularity conducted through speculation, architectural design and material exploration. The definitions, and spatial and structural characteristics of Unwanted Wood are new to the discipline and MIT. This means that our collective learning experience will be informed by discussion, exploration, and knowledge sharing. We encourage participation in studio: contributing to discussions with peers, speakers and guests and peer to peer project crits and discussions. The WASTE + 1 studio will be fully in person, so that students can work with unwanted wood in the studio and with MIT shop resources.

STUDIO GRADING RUBRIC:

Grades for the studio Design Problems are based upon the following criteria:

- Participation in Studio discussions, information sharing and collaborative teamwork
- Quality of concept, experimentation, and level of development in two Studio Problems
- Ability to demonstrate an iterative design process to explore/assess options for unwanted wood
- Ability to engage/experiment with the Digital Circularity Tool Kit
- Design development of a 'waste' wood building element/ building system, reproducible at scale
  Self-Reflective capability: the student's capacity to reflect upon and critique their own work

READINGS & REFERENCES

On the Studio Canvas site students will access the Studio PDF Handbook of curated wood construction and architectural precedents. The studio bibliography includes books, online articles and technical resources for Studio and Workshop subjects to support student research and design.