BC6675 | Residential Design & Construction | GT Serve Learn Sustain & DOE ZEDD Affiliated Course

Instructor: Frank Wickstead
Office Hours: By appointment only
E-Mail: Please keep all communication within Canvas or message in the case of an emergency
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Class Schedule: Tuesdays & Thursdays, 3:30 PM - 3:45 PM, in-person required
Classroom: West Architecture, Room 258
CRN: 93881
Required Text: Fundamentals of Residential Construction, FIFTH Edition By: Edward Allen, Alexander C. Schreyer, Rob Thallon, ISBN-13: 9781119811565

Topics Covered:

- Buildings and Energy Use
- Building Envelope Components
- Efficiency Retrofits and High-Performance Construction
- Introduction to Zero Energy and High-Performance Homes
- Efficiency-first design strategies and renewable energy integration
- City of Atlanta zoning and site feasibility analysis
- Principles of residential design process and design elements
- Application of residential building codes
- Wood frame construction fundamentals
- Sustainable mechanical, electrical, and plumbing systems
- Residential development feasibility and constructability
- Building lifecycle considerations

Course Description: This course explores the design, construction, and performance of single-family residential buildings, with emphasis on constructability, building science, zoning constraints, and real-world development considerations.Students will apply course concepts through community-based learning partnerships. The class will develop residential designs for real infill lots located in under-resourced Atlanta neighborhoods and surrounding communities. The course is affiliated with Georgia Tech's SLS/SCoRe initiative.Students will work in multidisciplinary teams and engage with real development constraints including zoning, code compliance, cost considerations, constructability, and neighborhood context.

Course Objectives: This course applies residential design and construction knowledge to a real-world community context.Students will work collaboratively on a residential infill project that incorporates workforce housing goals, high-performance building principles, and practical construction considerations.Participants will work in multidisciplinary teams based on their professional or academic strengths in areas such as:

- Being seen and heard
- Finance
- Site planning
- Architecture and design
- Engineering
- Marketing and communications
- Project management
- Construction administration

This course is structured as a cross-disciplinary undergraduate and graduate collaboration. Student success will depend heavily on meaningful team participation, engagement with the community partner, and active involvement in class discussions.

Community-Based Learning Partnership: This course includes a community-based learning partnership with a nonprofit or municipal organization engaged in a mission-driven construction project. The specific community partner will be introduced during the first class meeting. Students will develop residential design proposals for real sites that reflect current community needs and priorities. Projects will be grounded in real-world constraints including zoning, constructability, and budget considerations. The partnership aims to support responsible neighborhood development by producing context-sensitive, buildable housing designs that align with community goals and long-term sustainability. The shared goal is to contribute design ideas that may inform future development efforts, while exposing students to the realities of working within community-driven projects. The community partner benefits from receiving thoughtful design proposals informed by building science, planning, and construction considerations. Students benefit by applying academic

knowledge to real development scenarios and gaining experience working within the framework of a mission-driven project.

Additional Course Requirement: Students will participate in a REQUIRED **Habitat for Humanity build day or similar volunteer activity** related to residential construction and community housing. The volunteer day will occur **on a Saturday (approximately 7:00 AM – 5:00 PM) during the semester.** Additional details will be provided during the course.

Course Outcomes: Upon completion of this course students will be able to:

- Design a single-family home or residential renovation that responds to community partner goals and site constraints
- Apply building science principles to residential design
- Understand residential construction systems and methods
- Interpret municipal zoning and development requirements
- Apply residential building code fundamentals
- Evaluate renewable energy systems versus efficiency-first strategies
- Collaborate across disciplines in a project-based environment
- Develop and deliver professional design presentations

Grading Scheme:

A	B	C	D	F
90% and above	80%-89%	70%-79%	60%-69%	<60%

Course Evaluation:

Homework	15%
Class Attendance and Participation	30%
Case Study Phase 1 (Midterm Presentation)	25%
Case Study Phase 2 (Final Presentation)	25%
Final Exam	5%
TOTAL	**100%**

Course Policies: This course operates as a professional, project-based environment. Show up prepared, participate, and act like a professional. Respect your classmates, guest speakers, and community partners. If you're disruptive or checked out, you'll be asked to leave.
Attendance: Attendance matters. This is not a lecture-only course, you miss class, you miss the work.
If you miss class, it's on you to get caught up. You will be graded on your performance in each class.
Assignments: Deadlines are real. Work is due when assigned. Late work will not be accepted unless cleared in advance. Extensions are granted for legitimate reasons, not poor planning.
Communication: Use Canvas or scheduled meetings. Expect a response within ~48 hours on weekdays. Do not email about grades, handle that in person.
Technology: Use laptops for class work only. Phones stay silent. Step out if you need to take a call.
Academic Integrity: Follow the Georgia Tech Honor Code. All work submitted must be your own unless explicitly approved as collaborative. Use of AI (ChatGPT or similar tools) to generate or complete assignments is considered academic misconduct and will be treated as cheating/plagiarism.
Teamwork: You are expected to pull your weight. If you don't contribute, your grade will reflect it. Peer input will be used in grading.
Field Work: Site visits and field activities may be required. Follow all safety rules and come prepared.
Accommodations:Students needing accommodations should contact Georgia Tech's Office of Disability Services early in the semester.
Final Note: This course is built on participation, accountability, and real-world application. If you engage, you'll get a lot out of it. If you don't, it will show.