

Auburn University

Education Success Story

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The Auburn University Program really showed us how to use a variety of tools to solve real-world design and construction problems. Right now, I'm wearing many different hats on a large industrial-scale project. I am helping with everything from 4D schedule simulation and coordination to QA/QC.

— Dylan Cook
VDC Engineer
Turner Construction Company

Embracing collaboration.

Auburn University prepares future leaders in design and construction for career success in a fast-changing building industry.



Image from final project – Grace Harriett and Dylan Cook

Program Introduction

The Master of Integrated Design & Construction program at Auburn University in Auburn, Alabama prepares students for career success in the integrated delivery of building projects. Offered jointly by the School of Architecture and the McWhorter School of Building Science, the program is designed to develop future leaders in both design and construction, two disciplines that have traditionally been taught—and practiced—as separate activities. To a large extent, industry has moved beyond this outdated approach toward new, more collaborative ways of delivering projects. “We developed the Integrated Design & Construction program to keep up with the changing industry,” says Joshua Emig, co-director of the program and an Assistant Professor in the architecture department at Auburn University. The program emphasizes team building and cross-disciplinary collaboration, with the ultimate goal of producing graduates who will help lead the future evolution of the design and construction industries.

Program Description

The 36-credit-hour program includes both a design and a construction track, each three semesters long. Students in both tracks share coursework in Design and Construction Processes, Collaborative Practice, and LEED™ for Integrated Delivery, as well as a joint Design-Construction Studio lab. Design-track students fulfill the balance of their degree requirements with additional studio time, while construction-track students study Integrated Building Processes and a variety of electives. Throughout the program, the students also gain valuable exposure to a new generation of digital resources, including parametric modeling, web-based shared work environments, and Building Information Modeling (BIM). These resources include Autodesk® Revit® software for BIM, Autodesk® Ecotect® Analysis, and Autodesk® Navisworks® project review software.

The program also leverages close ties with Turner Construction Company to give the students opportunities to gain real-world project experience. To date, the program has graduated three cohorts of students, with the first completing studies in spring of 2010.

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The program opened up new opportunities in design and construction for the recent graduates.

The Students

Four students from the first cohort recently gathered to discuss the Integrated Design & Construction Program at Auburn University and the impact that it has had on their professional lives. The first, Grace Harriett, received a Bachelor of Architecture from Southern Polytechnic State University in Marietta, Georgia. After graduation, Grace went to work for a mid-sized architecture firm in Atlanta, Georgia that specializes in architecture, master planning, and interior design. While there, she worked on commercial, retail, and mixed-use design projects. "I kept waiting to have an interaction with a contractor, to actually see something built," says Grace. "Although we worked on many projects, I never got that chance." When Grace began looking into graduate programs, she saw Auburn as a great opportunity to learn new skills that would open up career possibilities in architecture and construction management.

Dylan Cook graduated from the University of Colorado in Boulder, Colorado with a bachelor's degree in Environmental Design. His first job following graduation was an internship in a 'green' architecture firm. He next worked as a project engineer in Denver, CO and then at a design-build architecture firm in San Diego, California. Both Grace and Dylan pursued the Design Track in the Program.

Michael Dooley earned a Bachelor of Science in Building Construction in 2008 from Auburn University. He then went to work for a construction

firm on a prominent local project in Atlanta, gaining valuable experience in project management. When financing on the project fell through, Michael made the decision to differentiate himself from the competition by enrolling in the Program.

Ben Loftin graduated from Auburn University in May 2009 with a bachelor's degree in Building Science. While studying, he completed three internships with residential and general contractors. Unlike his fellow students, who worked in the private sector, Ben enrolled in the program immediately after finishing his undergraduate degree in 2009. "There were not many jobs available," says Ben. "This program completely changed my career path." Both Michael and Ben pursued the Construction Track.

The Program

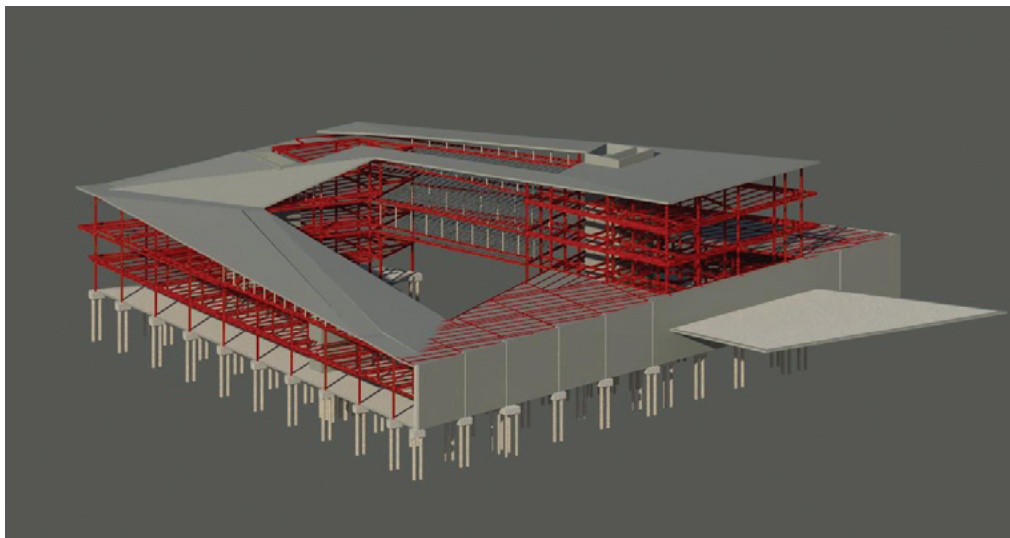
When designing the program curriculum, Auburn University gathered input from numerous professionals in the construction and architecture fields. One key takeaway was the need for hands-on learning scenarios that closely mimic real-world project workflows. "At Auburn University, we spent a lot of our time working in studio teams composed of both design and construction management team members," says Grace. "That exposed us to a lot of soft skills that you don't normally develop until you enter a professional environment."

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VDC/BIM Preconstruction Engineer
Turner Construction Company

"That approach really set us apart from other recent graduates," says Ben. "The program gave us a lot of differentiators that other people had to learn in their first years on the job." One of the biggest was learning how to collaborate with both the architects and construction management personnel. "Knowing how much time architects put into their work gave me a unique perspective and has helped me have a much better relationship with architects than I probably would otherwise have had." Other important differentiators were BIM, design-build methodology, and integrated project delivery. "Those are really new concepts. The industry wants students with that kind of knowledge. It sets us apart."

Michael echoed Grace's and Ben's comments. "As an undergraduate studying construction, I focused primarily on the elements of a building project that occur after the creation of construction documents," says Michael. In the program, however, he began to focus on preconstruction activities. "I have a much better understanding of the preconstruction environment now. What they really taught us was how to collaborate and see past the model to the actual end result. That is really what has made the four of us so successful—and so employable."



Rendering of structural system – Mike Dooley and Ben Loftin. Communicating a structural plan using Autodesk Revit helped the designer understand how structural elements would impact their floor plans.

Dylan summed it up well: “Collaboration is hard. The more people you can interact with, the better you are going to get at it.” All four recent graduates also attributed some of their success to the Program’s commitment to teaching software such as Autodesk Revit and Autodesk Navisworks, which they were able to download and use for free as members of the Autodesk student community.

At Auburn, the students also focused on sustainability. “We took one dedicated sustainability class, in which we learned a variety of topics and software, including Autodesk Ecotect Analysis,” says Ben. “The principles of sustainable design were interwoven throughout the program. Employers want people with that kind of background.”

Real-World Skills

A key industry partner in the program is Turner Construction Company, which recently signed a global strategic agreement with Autodesk. Turner actively seeks young professionals who understand the collaborative nature of today’s building projects, and are comfortable engaging the architect, the engineers, the owner, and the trade contractors. “Turner has a strong college recruitment program that looks for the next generation of leaders in our company,” says James Barrett, director of the Integrated Building Solutions group at Turner. Once recruits are on board, Turner invests in development of their skills, and creates opportunities for their growth. Turner selected eleven students from among the 250 college recruits hired in 2010, trained them in BIM technology and tools, and placed them in offices across the country.

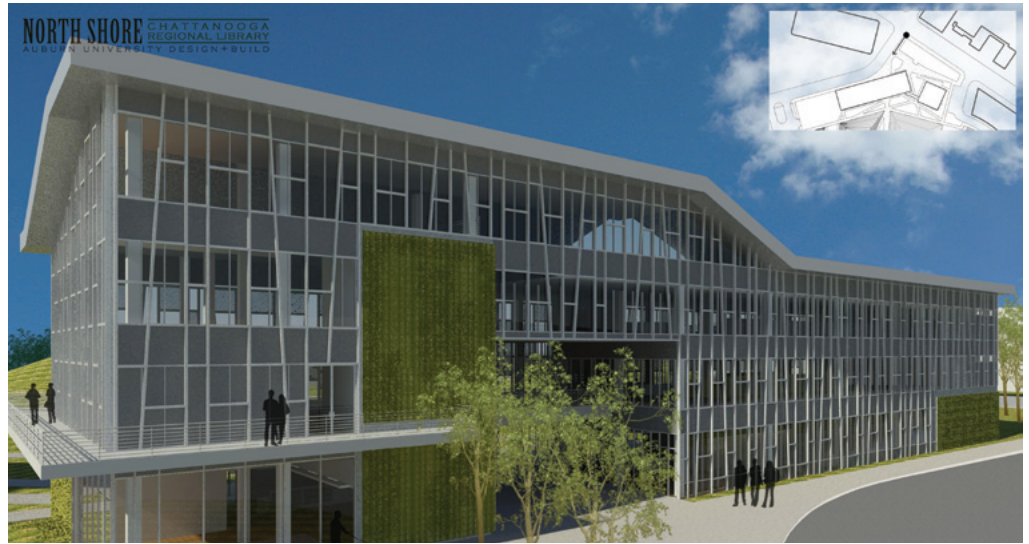


Image from final project – Grace Harriett and Dylan Cook

As part of the outreach associated with this effort, Barrett began to develop a partnership with the Integrated Design & Construction Program at Auburn University, meeting with faculty and speaking with students in the classroom. Turner has also invited the students to participate on projects, including the Martin Army Community Hospital at Fort Benning, Georgia. “Turner asked our students to help formulate strategies for prefabricating patient bathrooms and rooms in the new hospital,” says Emig. “They gave our students carte blanche. The students spent the first half of a semester looking at different ways to use prefabrication, just-in-time delivery, and lean batch methods to maximize construction efficiency. A few of them pushed further and started to design and develop actual products that would tie in with the strategies they developed.” The students presented their findings at Fort Benning.

developed within Turner. “The students emerged as more advanced, more sophisticated users of BIM,” says Barrett. As a result of BIM University’s initial success, Turner selected 25 students from the 2011 recruiting class to participate.

Satisfying Careers

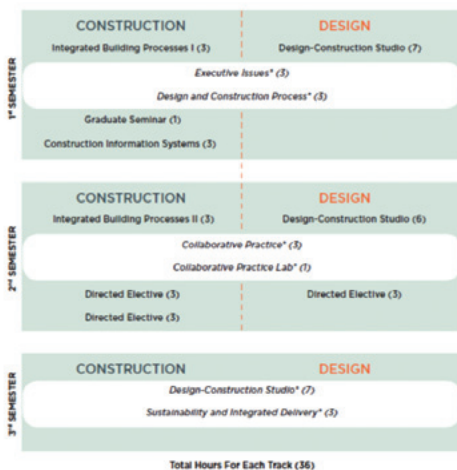
Grace Harriett, LEED AP® BD+C, currently works in Turner’s Washington, D.C. office as a VDC/ BIM Preconstruction Engineer. “The education we received at Auburn University set us apart from other people coming out of school at the same time,” says Grace. “It has also exposed us to a side of our company that most entry-level employees don’t get to see.”

Grace continued, “At Turner, my love of design, and my design background give me a unique perspective. We work with architects all the time. A lot of exciting things are happening in the industry.”

The Result

Students who have graduated from the program have fared well, even in today’s sluggish economy. “Auburn University has a unique and successful program that helps students bridge the gap between design and construction,” says Barrett. “Four of the thirty six people we hired in the first two years of our search are from Auburn.”

Before joining their respective offices within Turner, Grace, Dylan, Michael, and Ben took part in BIM University, an eight-week, BIM-immersion course



Master of Design Build Program Curriculum at Auburn University

Michael Dooley works in Turner's Cincinnati, Ohio office, performing a variety of tasks, including modeling, site logistics, 4D scheduling, and quantity takeoffs using BIM. "The Auburn program really put me in a position to be successful," says Mike. Using what he learned at Auburn, Mike has been able to provide unique services to Turner's clientele.

"Our clients sometimes ask us to push the limits of green design—something the architect usually handles." For example, Turner recently helped a client in Cincinnati model a building and perform a sunlight study early in the project. "The client loved it. With help from Ecotect Analysis, we were able to show them that no direct sunlight would fall on a massive curtain wall and that there was no need for a shading device at that location."

Ben Loftin, VDC engineer, works out of Turner's office in Nashville, Tennessee on a large healthcare project. "Turner as a whole does a really great job of emphasizing sustainability—even just from the standpoint of making sure the preconstruction staff in our offices go through the training necessary to become LEED APs," says Ben. "That's a huge initiative within Turner."

Dylan Cook, also a VDC engineer, works at Turner's office in Tempe, Arizona. "The Auburn University program showed us how to use a variety of different tools to solve real-world design and construction problems," says Dylan. "Right now, I'm wearing many different hats on a large industrial-scale project. I am helping with everything from 4D schedule simulation and coordination to QA/QC."

Next Steps

The four graduates had plenty of advice for aspiring students of architecture or construction. "Learn everything you can," says Michael. "Revit, Navisworks, Ecotect Analysis. All those things can give you an edge when you're interviewing."

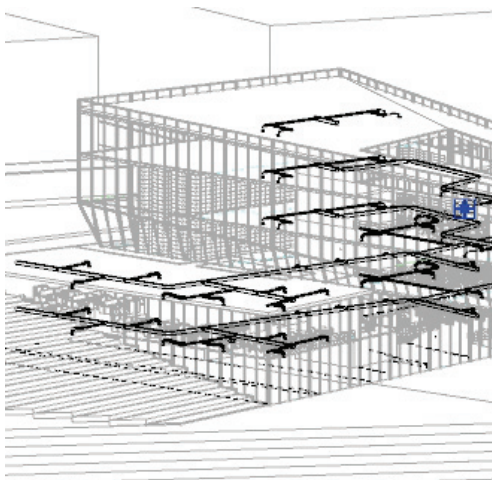
"Stay up on the latest technology and be committed to self-education," echoed Grace. "With the Internet, it is easier than ever before to learn on your own and then apply what you've learned to projects in school or at work."

"Try to get as much exposure as you can, because there's a lot of free software, especially at the Autodesk Education Community," says Ben. "Download products like Autodesk Revit or Navisworks or Ecotect Analysis and get some experience with them. You're going to have to learn them on your jobs. Knowing them before you enter the workforce can be a huge advantage."

For more information, visit www.autodesk.com/edcommunity.



Image from final project – Grace Harriett and Dylan Cook



Study of exposed ductwork - Mike Dooley and Ben Loftin.

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